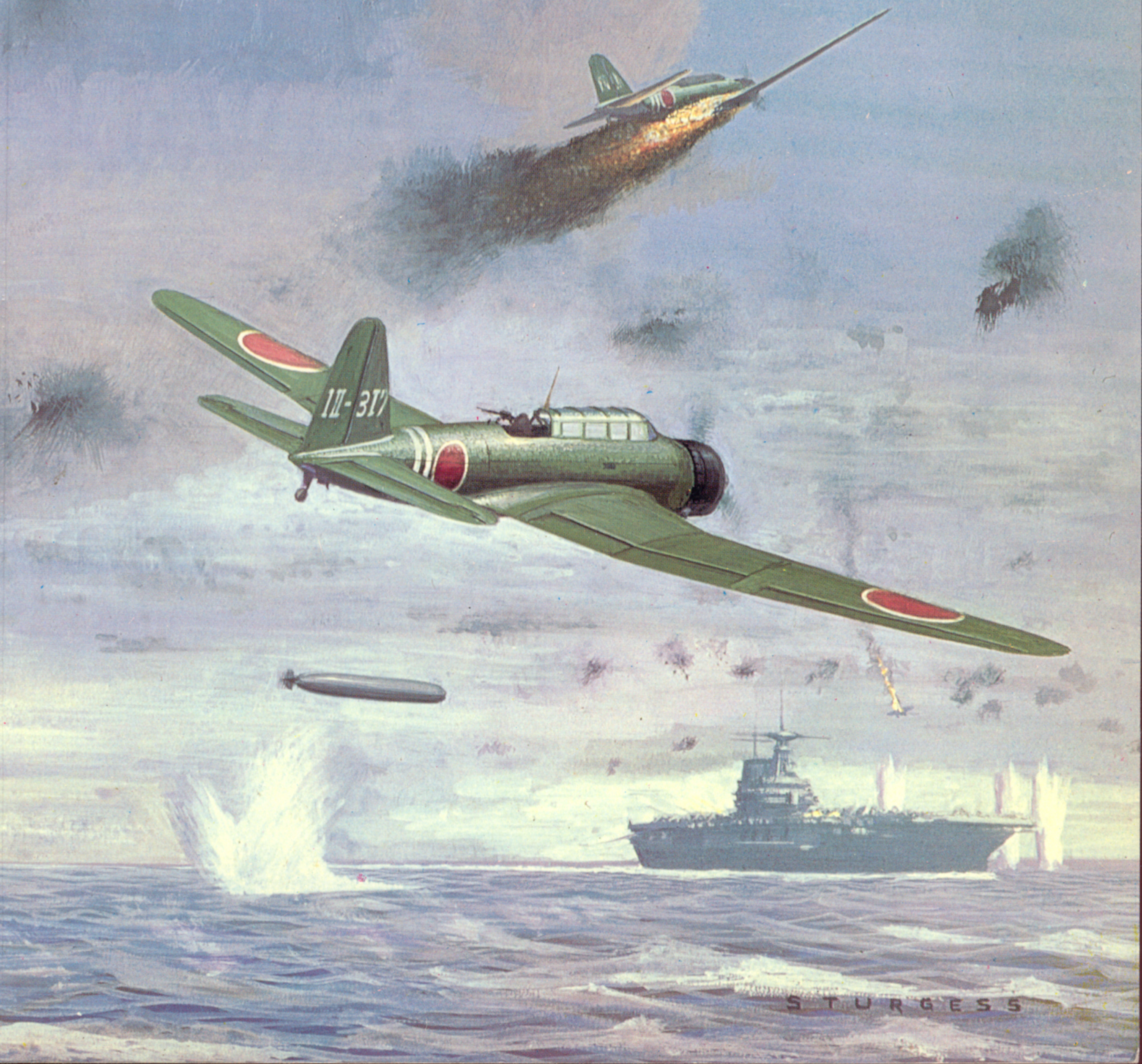
OSPREY/**AIRWAR 21**

JAPANESE CARRIER AIR GROUPS 1941-45

BY RENÉ J. FRANCILLON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OSPREY/**AIRWAR** SERIES
EDITOR: JERRY SCUTTS

JAPANESE CARRIER AIR GROUPS
1941-45

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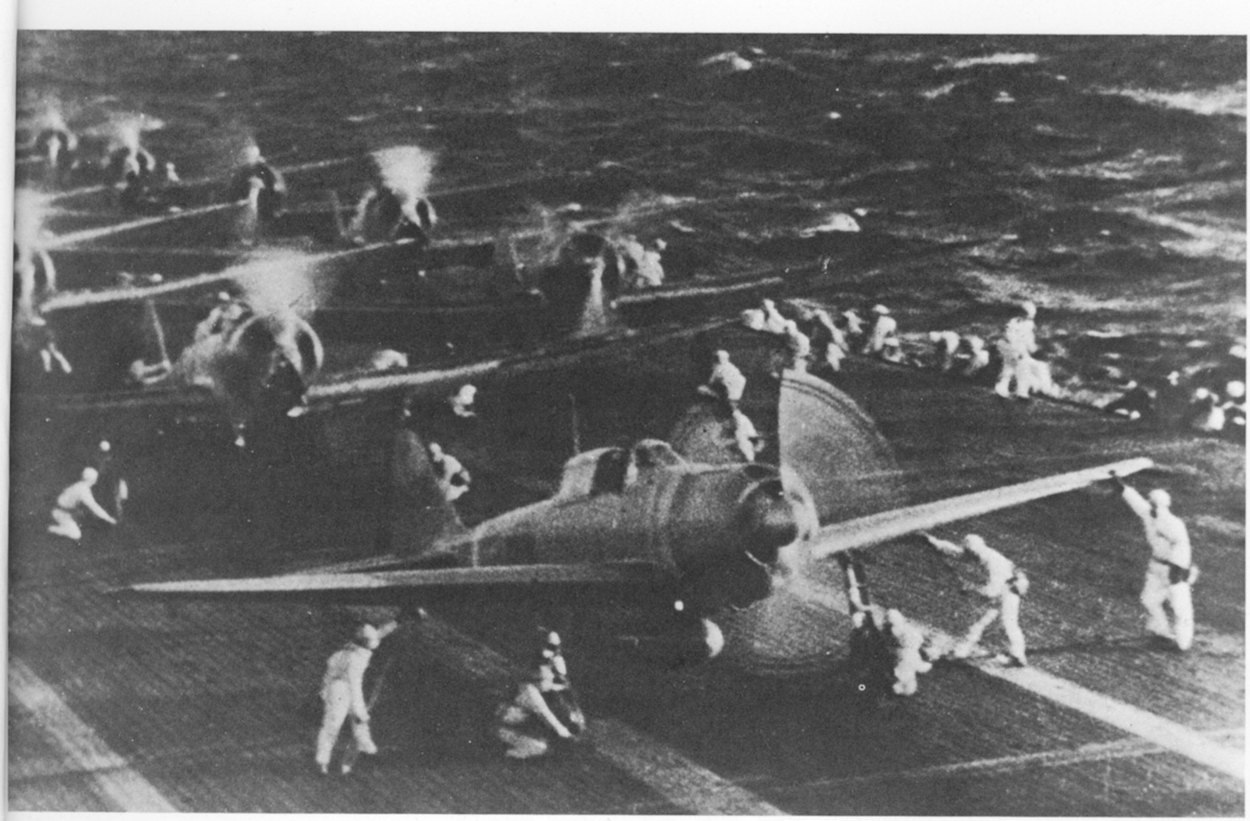
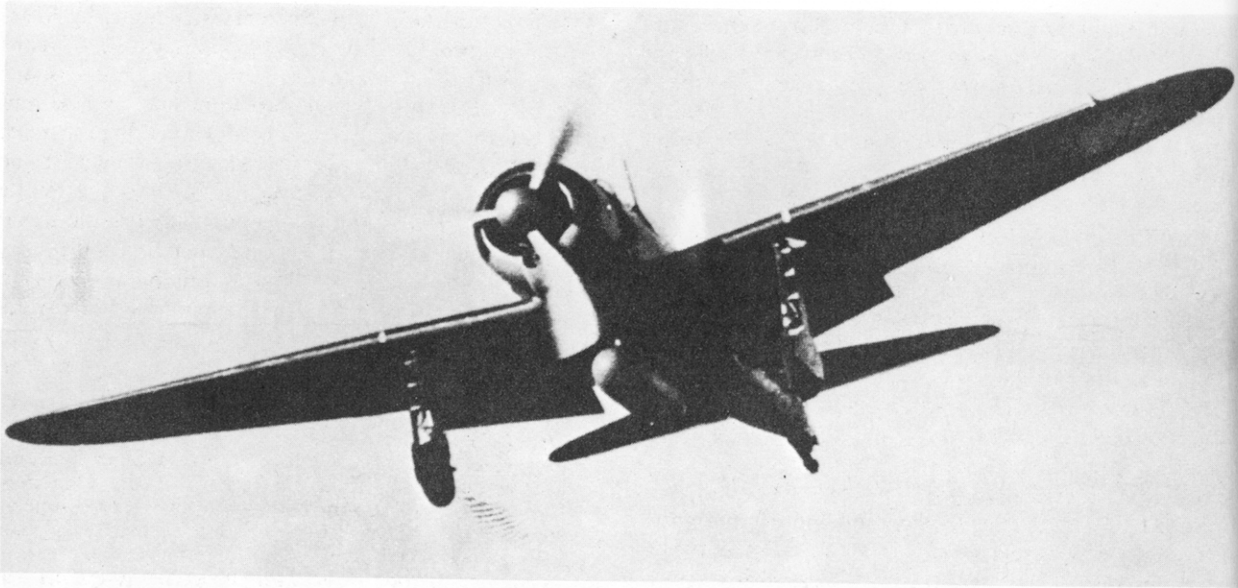


Aircraft of the *Shokaku* air group, identified by the single white band around the aft fuselage, about to be launched at the time of the Hawaiian Operation. The aircraft in the foreground is a Mitsubishi A6M2 fighter, whilst those aft are Aichi D3A1 dive bombers. (US Navy)

Early Success

'*Niitaka Yama Nobore*' (Climb Mount Niitaka), the prearranged code signal for the planned attack against the US Pacific Fleet at Pearl Harbor, was flashed on 2 December 1941 from the battleship *Nagato* in the Inland Sea to the carriers of the First *Koku Kantai* (First Air Fleet) sailing under complete radio silence in the North Pacific. Five days later the Japanese carrier air groups struck a telling blow against the US Navy and for six months they ruled the Pacific and Indian oceans almost at will. Yet, forty-four months later, the city of Hiroshima, off which the *Nagato* had been anchored when this fateful signal had been transmitted, lay in ruins, the victim of the first atomic bomb, and the once proud and formidable *Rengo Kantai* (Combined Fleet) was being hunted in its last refuges. Complementing the previously published *US Navy Carrier Air Groups*, this volume in the AIRWAR series is a brief synopsis of the Pacific operations in which the carrier air groups of the Imperial Japanese Navy took part.

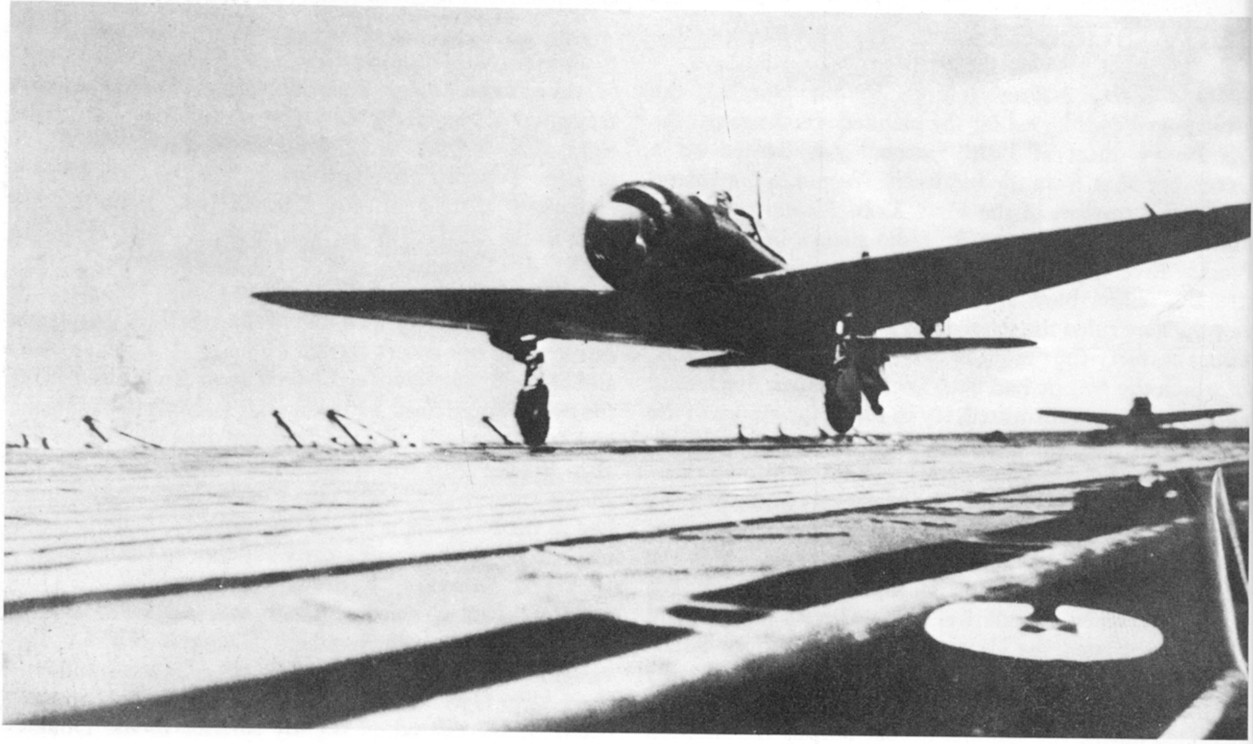
By 1941, when the political tension between Japan and the United States, the United Kingdom and the Netherlands steadily grew, the IJN had truly become a potentially formidable foe. Its carrier strength had been markedly increased during the summer of that year by the addition of the *Shokaku* and *Zuikaku*, two fast carriers with armoured flight decks and accommodation for up to eighty-four aircraft each, which gave it a total of nine carriers. Together the air groups assigned to these carriers embarked a total of 501 aircraft (184 fighters—135 Mitsubishi A6M2s and 49 Mitsubishi A5M4s; 135 Aichi D3A1 dive bombers, and 182 torpedo bombers—174 Nakajima B5N2s and 8 Yokosuka B4Y1s). This strength compared favourably with that of the US Navy (seven fast carriers and one escort carrier with a total of 512 aircraft) and of the Royal Navy (eight carriers with 243 aircraft), as the two Western fleets had to operate not only in the Pacific and Indian oceans, like the Imperial Japanese Navy, but also in the Atlantic and Arctic oceans and in the Mediterranean and North seas. Furthermore, the Japanese had in the Mitsubishi A6M2 fighter and Nakajima B5N2 torpedo bomber aircraft clearly superior to contemporary Western naval fighters (Grumman F4F-3 Wildcat/Martlet, Fairey Fulmar and Hawker Sea Hurricane) and torpedo bombers (Douglas TBD-1 Devastator, Fairey Swordfish and Fairey Albacore), and only their Aichi D3A1 dive bomber, itself an excellent aircraft, could be considered as slightly inferior to the Douglas



Mitsubishi A6M2 (Navy Type O Carrier Fighter Model 21) in landing configuration. Note flaps and ventral drop tank.

SBD-3 Dauntless of the US Navy. As for the quality and training of aircrews, the Japanese could take comfort in the knowledge that their ranks were cadred by veterans of air operations in China (where Japan had been embroiled in a series of incidents throughout the thirties and early forties) and thus could be expected to be equal to those of the Royal Navy and probably superior to the US Navy flight crews who lacked combat experience.

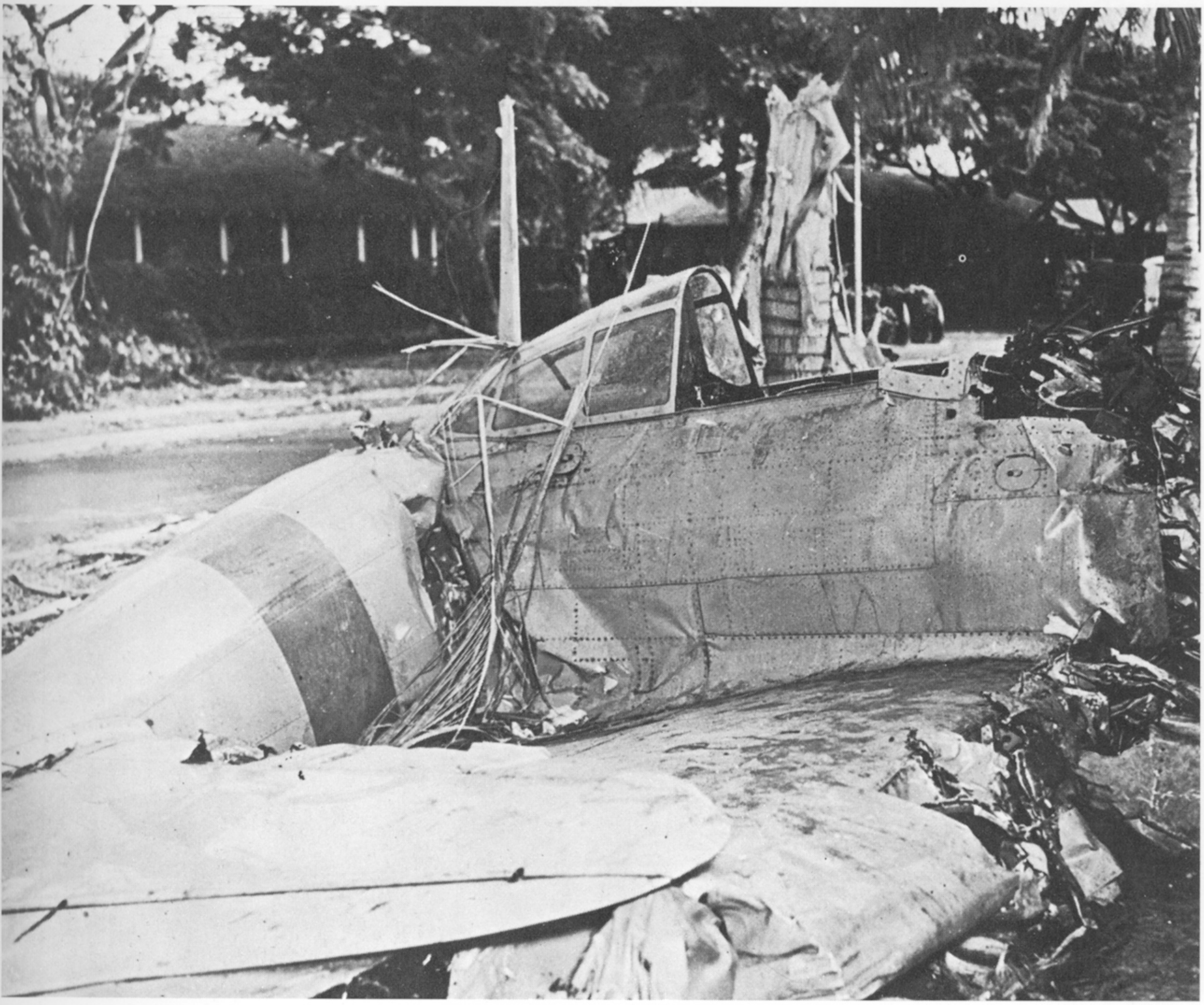
Whilst the nation's immediate military strength was sufficient for the initial phases of the war, Japan lacked the



Navy Type O Carrier Fighter Model 21 from a training unit taking off from a carrier. The aircraft is camouflaged in dark green and light grey, whereas the A6M2s flown by carrier air groups at the start of the war were sky-grey overall.

economic might necessary to sustain prolonged operations against the United States and her allies in the Pacific and Europe. This situation was well recognized by senior Japanese naval officers and, in particular, by Admiral Isoroku Yamamoto, the commanding officer of the *Rengo Kantai*, who a few months before Pearl Harbor said: 'Do not forget American industry is much more developed than ours . . . and unlike us they have all the oil they want. Japan cannot beat America.' However, in spite of doubting the outcome of a war against America, Adm. Yamamoto worked diligently to prepare his command to discharge its duties in the event of a war made very likely by the drastic economic sanctions imposed by the United States and Great Britain against Japan following the latter's occupation of French Indo-China in July 1941. To free Japanese forces which were to invade tin- and rubber-rich British Malaya and the oil-rich Dutch East Indies from direct interference by the US Navy and, more importantly, to forestall a direct US attack against Japan whilst these operations were taking place, Adm. Yamamoto sought to blunt the might of the powerful US Pacific Fleet. Assisted by his chief of staff, Adm. Shigera Fukudome, by Rear-Adm. Takijuro Ohnishi and by Commander Minoru Genda, Adm. Yamamoto devised a pre-emptive strike against Pearl Harbor. In so doing Yamamoto and his staff benefited from intelligence reports documenting the mock attack against Pearl Harbor, which had been staged in the early morning hours of Sunday, 7 February 1932 by the US carriers *Saratoga* and *Lexington*, as well as the Royal Navy's successful attack against the Italian fleet at Taranto, which had been mounted during the night of 11/12 November 1940. The first of these reports provided ideas on timing (early morning hours of a Sunday) and direction of approach (from the north), whilst the second pointed to

Wreckage of the A6M2 flown by Petty Officer Takeshi Hirano during the attack on Pearl Harbor. Markings included a red band around the aft fuselage (the colour of the band identified the First *Koku Sentai*, whilst the fact that there was only one band indicated that the aircraft was assigned to the *Akagi*) and the code AI-154 on the vertical tail surfaces. (US Navy)



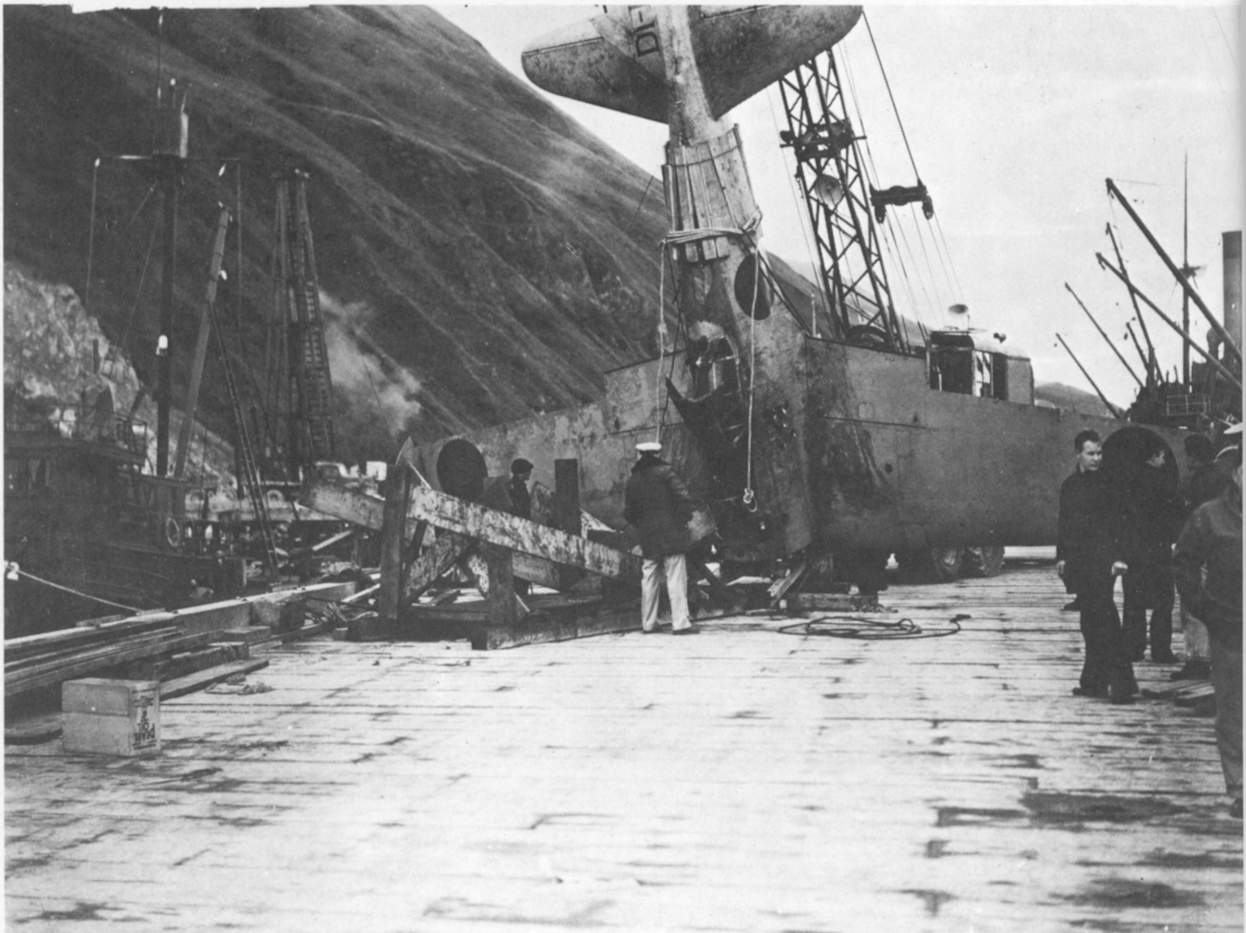
the need for developing special torpedoes for use in shallow harbour waters.

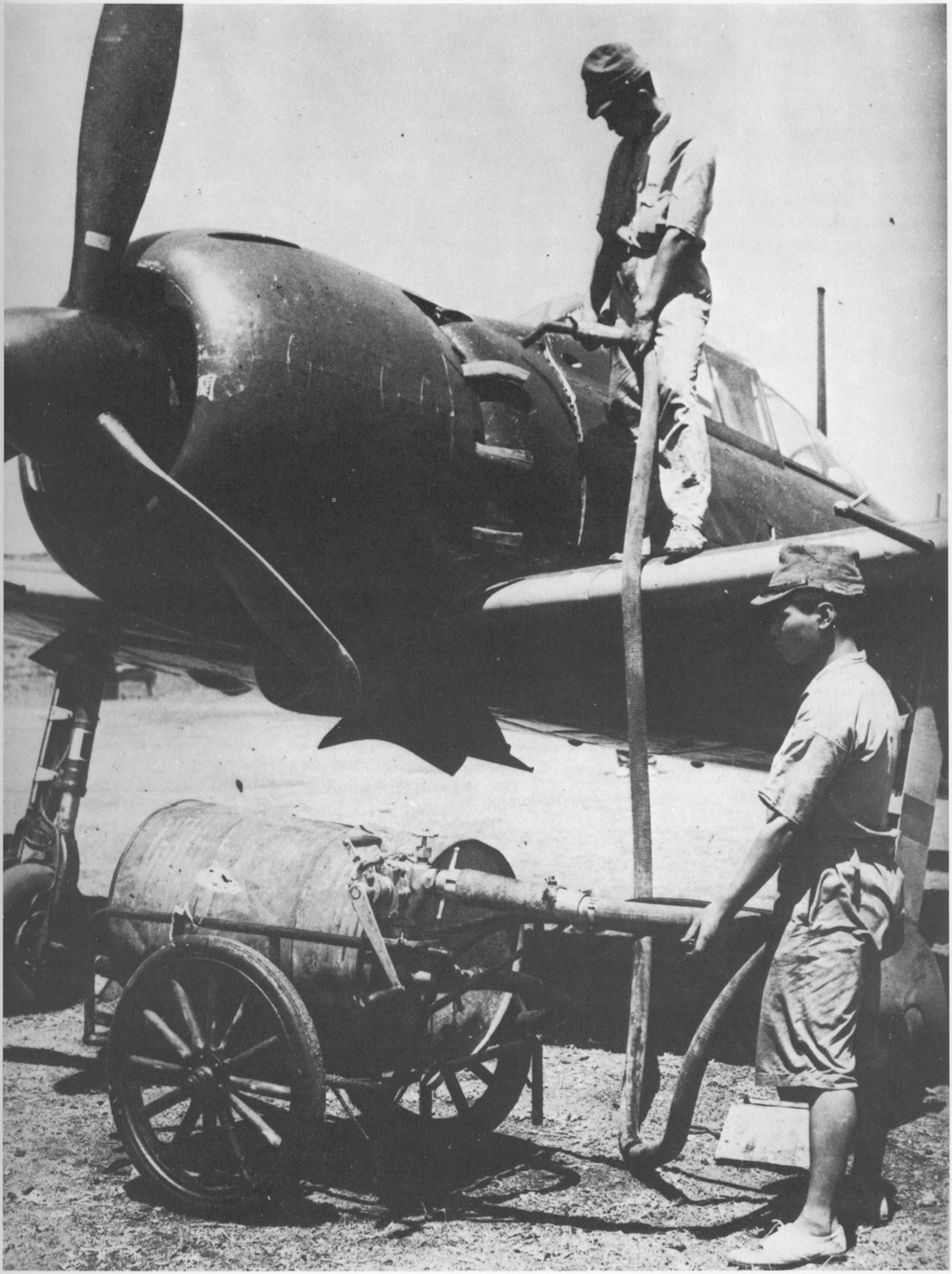
Yamamoto's plan, which it is important to remember called for the attack on Pearl Harbor to commence immediately *after* a formal declaration of war had been delivered by the Japanese Ambassador to the United States, was approved by the IJN on 3 November 1941. By then contingency training was well under way, and during that month, as negotiations between the United States and Japan were doomed, the First *Koku Kantai* (First Air Fleet), under Vice-Admiral Chuichi Nagumo, began assembling in Hitokappu Bay in the Kuriles. This powerful task force was comprised of the fast carriers *Akagi* and *Kaga* (First *Koku Sentai*, First Carrier Division), *Hiryu* and *Soryu* (Second *Koku Sentai*), and *Zuikaku* and *Shokaku* (Fifth *Koku Sentai*), embarking a total of 135 A6M2 fighters, 135 D3A1 dive bombers and 144 B5N2 bombers, and of two battleships, three cruisers and nine destroyers. Two other Japanese carriers (the *Ryujo* and the *Zuiho*, embarking respectively twenty-two and sixteen A5M4 fighters, and eighteen and twelve B5N2 bombers) were assigned to support the invasion of the Philippines, whilst the training carrier *Hosho* (eleven A5M4s and eight B4Y1s) was held in reserve in the Palaus.

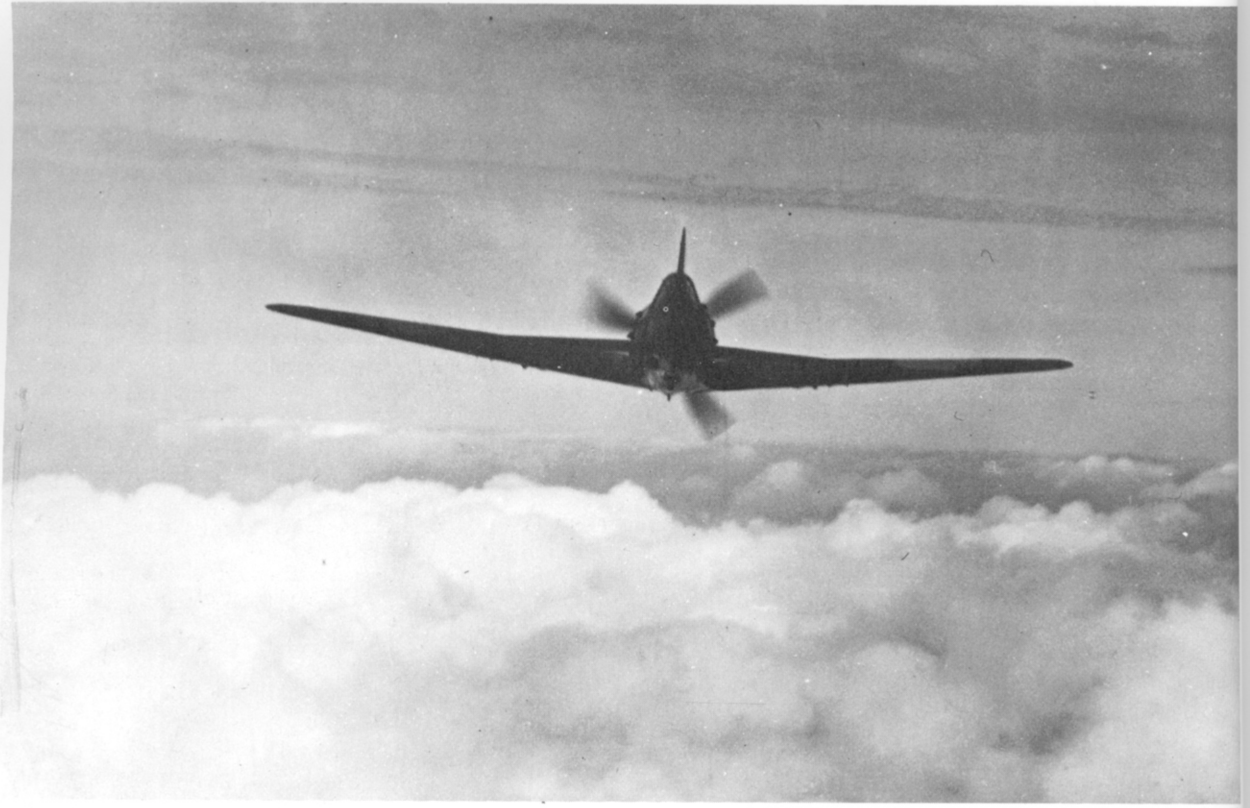
Vice-Adm. Nagumo's First *Koku Kantai* sailed out of Hitokappu Bay on the evening of 26 November and, observing complete radio silence, set course for Hawaii by way of the North Pacific, where heavy seas and dense fog limited the chance of being spotted. Six days later the code signal *Niitaka Yama Nobore* was received, but a small chance still existed that a last-minute agreement would be reached and that war between the United States and Japan could be averted. No such thing materialized and the

Navy Type O Carrier Fighter Model 52 (Mitsubishi A6M5) being refuelled from a primitive bowser consisting of a cart, a hand-operated pump and a barrel. Details of the cowling, individual exhaust stacks and protruding barrel of 20mm cannon are also noteworthy. (US Navy)

DI–108, the A6M2 in which Petty Officer Tadayoshi Koga was killed when attempting to crash land in a marsh on Akutan Island. The aircraft is seen here about to be loaded aboard a freighter to be transported to the US. (Department of Defense)







The Mitsubishi A6M5 was a development of the famous Zero fighter, which was used by Japanese carrier air groups during the last carrier battles of the war. Even though many improvements had been incorporated in this version, it was markedly inferior to the US Navy Hellcat and Corsair, whereas earlier in the war the A6M2 had been superior to the Wildcat. (USAF)

Japanese plenipotentiaries in Washington were instructed to deliver a declaration of war to the US Government. Difficulties in decoding the message from Tokyo resulted in the late delivery of this declaration and by then Pearl Harbor was already under attack. The administration of President Roosevelt, which had had ample intelligence information to conclude that Japan was indeed about to declare war, jumped on the opportunity of achieving a diplomatic coup and promptly capitalized on what the President called a 'Day of Infamy'.

While fifty-four A6M2s (nine from each carrier) provided CAP (Combat Air Patrol) over the ships of the First *Koku Kantai*, the first attack force, led by Cdr. Mitsuo Fuchida, had taken off at 0600hrs when the carriers and their escort were 200 miles north of Oahu. It was comprised of forty-five A6M2s (of which two had to abort) under the command of Lieutenant-Commander Itaya of the *Akagi*, of fifty-four D3A1s (less three aborts) under Lt.-Cdr. Takahashi of the *Shokaku*, of fifty B5N2s (less two aborts) each armed with a 800kg bomb (as no bomb of this size was available, 14-inch shells were specially fitted with fins to serve as armour-piercing bombs to be carried by level bombers) and placed under the direct command of Cdr. Fuchida, and of forty B5N2s each armed with a torpedo (specially fitted with wooden fins so they would run straight and not porpoise in shallow waters) and led by Lt.-Cdr. Murata of the *Akagi*. Forty-five minutes later a second attack force made up of thirty-six A6M2s led by Lieutenant Shindo of the *Akagi*, fifty-four B5N2s armed with 250kg and 60kg bombs under Lt.-Cdr. Shimazaki of the *Zuikaku*, and eighty-one D3A1s (less three aborts) under Lt.-Cdr. Egusa of the *Soryu* was launched. Their targets, the Pacific Fleet anchored around Ford Island, the airfields at Kanehoe, Ewa, Hickam and Wheeler, and other military targets on Oahu, were still peacefully unaware of the onslaught that was about to propel them and the United States into the Second World War.

Approaching Oahu from the north the Japanese carrier aircraft led by Cdr. Fuchida circled the island to attack from the south. As the dive bombers of Lt.-Cdr. Takahashi turned into position, whilst the torpedo bombers of Lt.-Cdr. Murata dove to sea level and the fighters of Lt.-Cdr. Itaya climbed to protect the bombers from possible interception, Cdr. Fuchida and the level bombers' crews faced an incredible scene, which Fuchida later described:

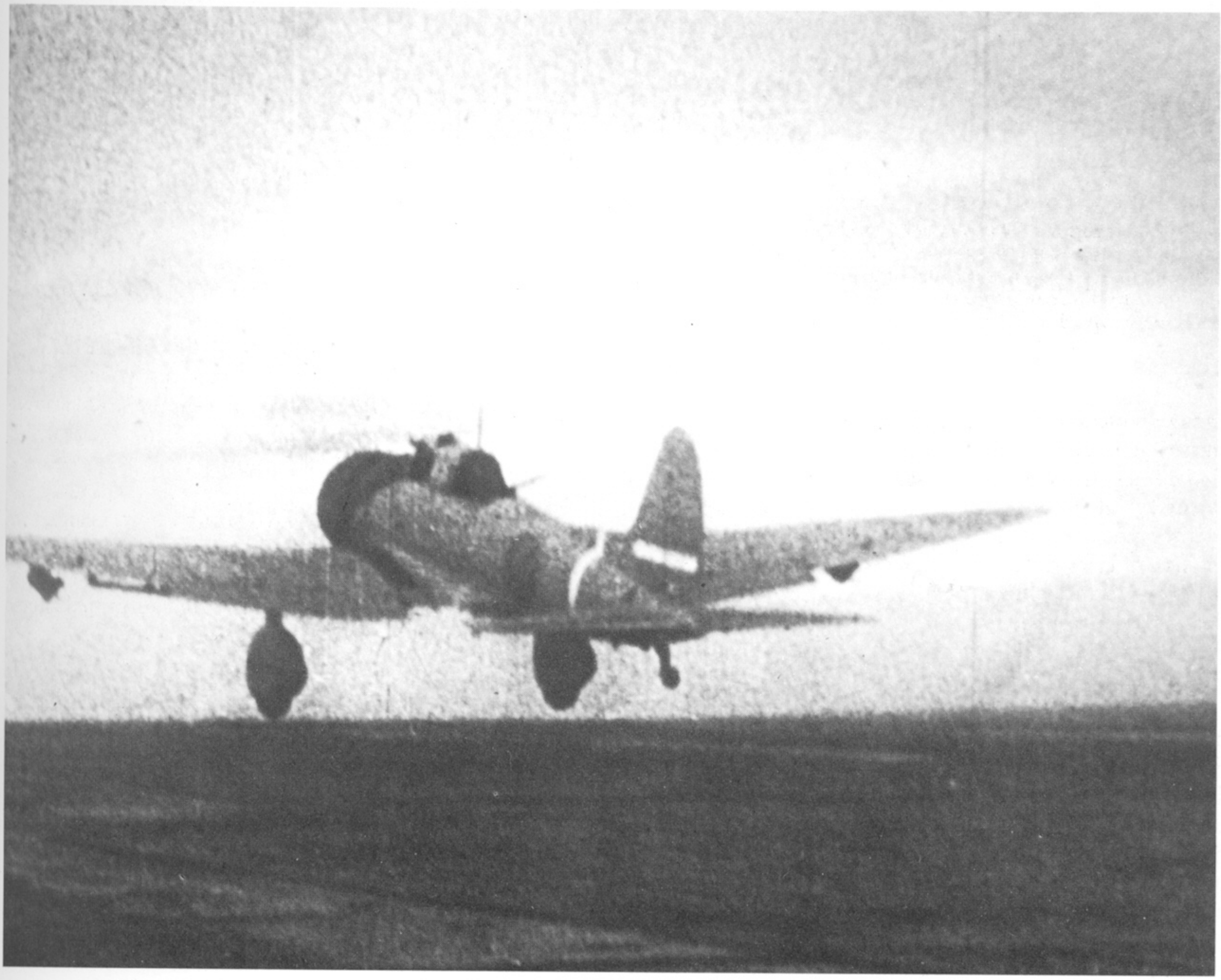
> Below me lay the whole US Pacific Fleet in a formation I would not have dared to dream of in my most optimistic dreams. I have

> seen all German ships assembled in Kiel harbour. I have also seen the French battleships in Brest. And finally I have frequently seen our own warships assembled for review before the Emperor, but I have never seen ships, even in the deepest peace, anchored at a distance less than 500 to 1,000 yards from each other. A war fleet must always be on the alert since surprise attacks can never be fully ruled out. But this picture down there was hard to comprehend. Had these Americans never heard of Port Arthur?

Thrilled by the lack of American preparedness, Fuchida sent the code message '*Tora, Tora, Tora*' to inform Vice-Adm. Nagumo that the attack was a complete surprise.

First to attack were the fifty-one D3A1s, which divided their attention between Wheeler Field, the main USAAF fighter base, Hickam Field, the USAAF bomber base, and Ford Island, where at 0755hrs the first bombs destroyed seven PBY-3s and damaged five more. One minute later the first torpedo struck the battleship *West Virginia*. Other torpedoes hit the battleships *Arizona*, *Oklahoma* and *Nevada*, as well as the cruisers *Helena* and *Raleigh*, and the ex-battleship *Utah*. Meanwhile, the level bombers joined the fray and scored hits on the battleships *Arizona*, *California*, *Maryland*, *Tennessee* and *West Virginia*, and on the repair ship *Vestal*. Meanwhile, the dive bombers continued to strike airfield facilities, whilst the fighters engaged a flight of SBDs from the carrier *Enterprise* and B-17s just completing their ferry flight from California. The A6M2s also strafed parked aircraft at Wheeler, Hickam, Ewa and Kanehoe Fields. Losses incurred in the process were limited to five B5N2s, three A6M2s and one D3A1.

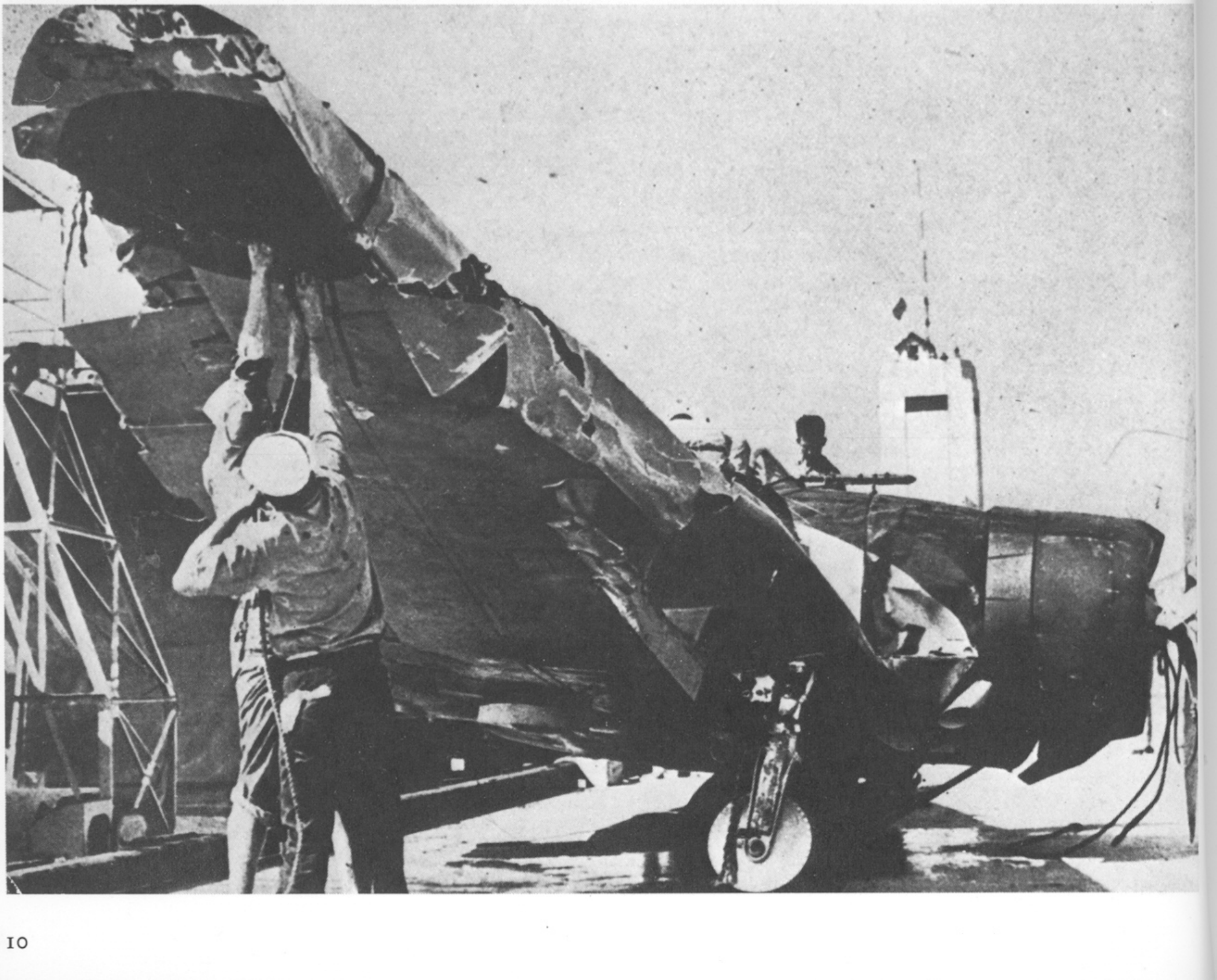
The second attack unit, which did not include torpedo bombers and which had level bombers armed with smaller bombs (each carried one 250kg and six 60kg bombs instead of the 800kg projectile carried by the bombers of the first wave), was cleared to attack at 0855hrs. By then, however, the Pearl Harbor defence was fully alerted and some fighter aircraft rose to challenge the Japanese attackers, while all available anti-aircraft guns were manned. Nonetheless, the D3A1s dove on the ships around Ford



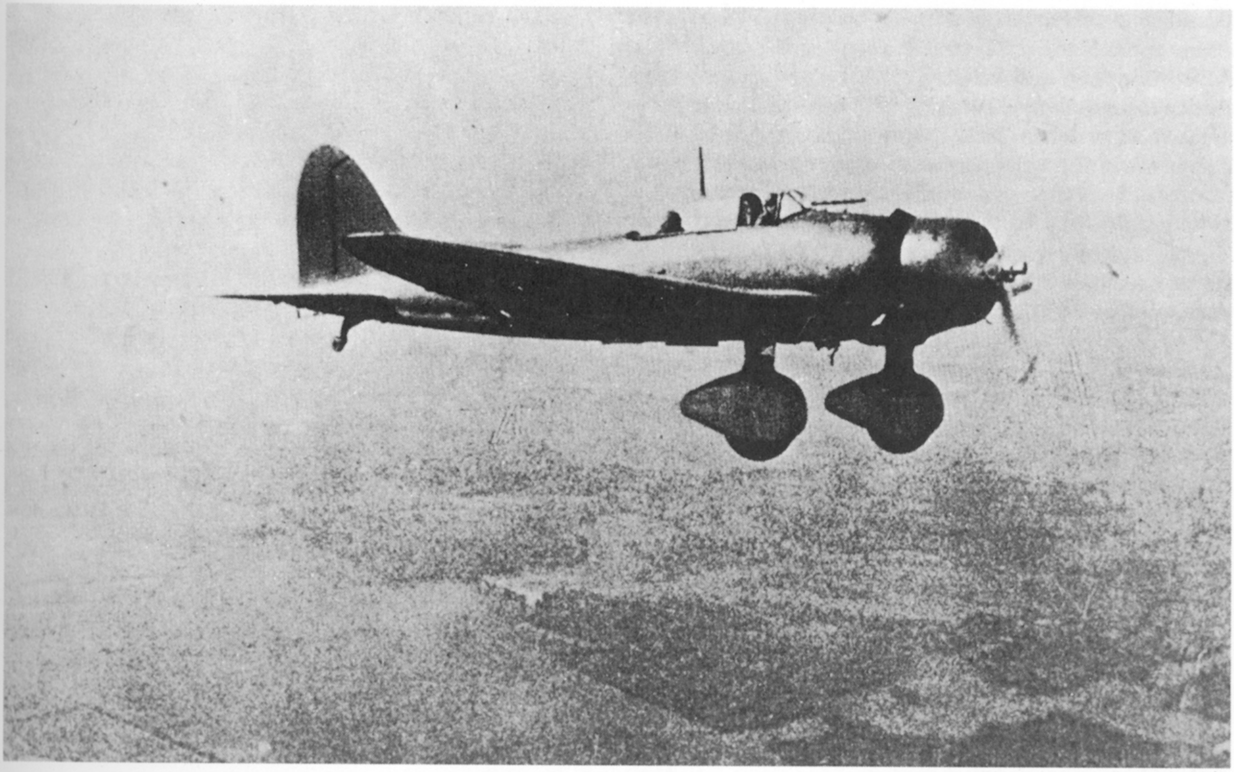
Aichi D3A1 (Navy Type 99 Carrier Bomber Model 11) taking off from the *Shokaku*. Lt.-Cdr. Takahashi, whose aircraft this photograph is purported to show, led the dive bomber component of the first attack force during the Pearl Harbor raid. (US Navy)

Island and scored hits on the battleships *Nevada* and *Pennsylvania,* the cruisers *Honolulu* and *Raleigh*, the destroyers *Cassin, Downes* and *Shaw,* and the seaplane tender *Curtiss*. The level bombers, supported by strafing fighters, concentrated their efforts on the airfield facilities. The task of the attackers, however, was made difficult by the few P-40s and P-36s which managed to take off and by increasingly effective AA fire. Losses incurred by the second attack force included fourteen D3A1s and six A6M2s, including that flown by Lt. Fusata Iiida, who after being hit elected to crash into parked aircraft at Kanehoe. The price paid was small as the two attacks resulted in the destruction of 167 US aircraft (sixty-six from the Navy, thirty from the Marines and seventy-one from the USAAF) and in putting out of action for six months the battleship force of the Pacific Fleet (although heavily damaged or sunk, all US warships hit at Pearl Harbor—with the exception of the *Arizona*, *Oklahoma* and *Oglala*—were subsequently salvaged). However, even though it was brilliantly executed by the six carrier air groups of the First *Koku Kantai*, the Hawaiian Operation had to be termed a strategic failure as, on the one hand, it united all Americans behind the needed war effort and, on the other hand, the aircraft carriers of the Pacific Fleet had escaped damage, as all three had been out of Pearl Harbor on that fateful Sunday morning. The consequences for the Imperial Japanese Navy and its carrier air groups were soon to be felt.

Wreckage of one of the fifteen D3A1s lost by the First *Koku Kantai* during the attack against Pearl Harbor being inspected by US personnel. Note how black paint on cowling feathered up and back towards the cockpit. (US Navy)



As already mentioned, the light carriers *Ryujo* and *Zuiho*, with their air groups still equipped with obsolete Mitsubishi A5M4s (monoplane fighters with open cockpits and fixed undercarriages) and Nakajima B5N2 bombers, had been assigned to support landing operations in the Philippines. In the event, the availability of an adequate number of Formosa-based Mitsubishi A6M2s with sufficient range to escort bombers on missions to Manila resulted in the *Zuiho* being sent back to Japan for other assignments. The *Ryujo*, on the other hand, took part as scheduled in the invasion of the Philippines, when on the first day of the war its B5N2s bombed land targets around Davao and the seaplane tender *Preston*, which was anchored in Davao Gulf. The *Preston* escaped damage, but



With its trousered undercarriage and dive brakes beneath the wings, the Aichi D3A1 had in 1941 a somewhat obsolescent appearance. Nonetheless, the type proved highly successful and sank more Allied warships than any other aircraft flown by the Axis powers. (S. Bon)

two of its PBY flying-boats were sunk by A5M4s. In the next few days the *Ryujo* air group provided support for the landing at Legaspi and damaged a number of B-17s which were attempting to bomb the beachhead. The carrier and its air group then performed similar duties at Davao and Jolo prior to returning to Peleliu in the last week of December.

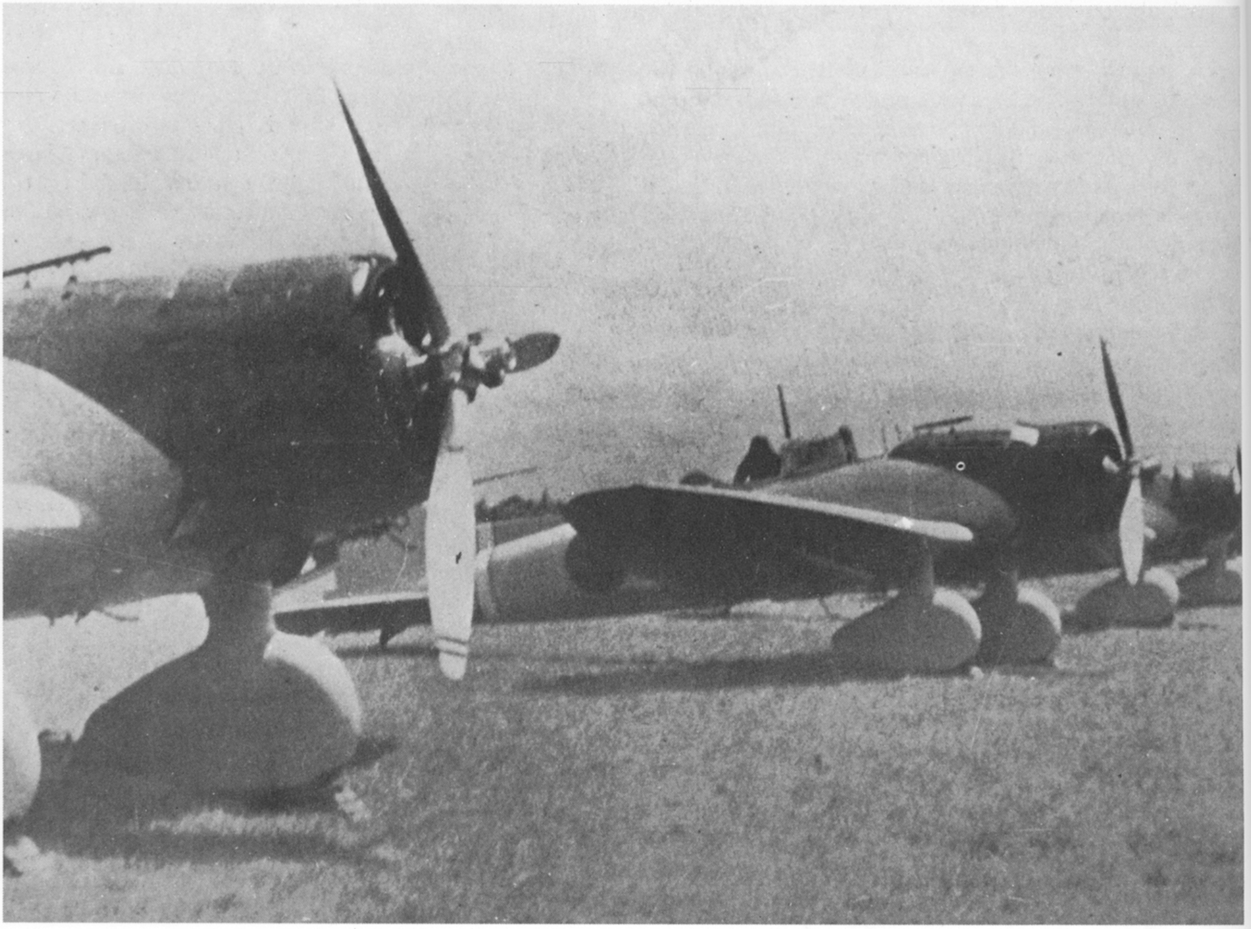
Meanwhile, on its return from the Hawaiian Operation, the Second *Koku Sentai* (*Hiryu* and *Soryu*) was detached from the main body of the First *Koku Kantai* to assist in the invasion of Wake Island, where the stubborn resistance of VMF-211 had frustrated the efforts of Japanese land-based bombers operating from Kwajalein Atoll. Arriving off Wake on the morning of 21 December, the *Hiryu* and the *Soryu* struck the island for the next two days and destroyed its last two fighters and AA fire control equipment. On the 23rd, under the protective umbrella of the two carrier air groups, Japanese troops landed on Wake and overwhelmed the garrison to add one more success to a list which then appeared endless. Yet, the turn of events was almost changed as, at the time of the Wake surrender, the carriers *Lexington* and *Saratoga* were only 400 miles from the island and the first carrier battle was avoided when the US carriers were ordered back to Pearl Harbor.

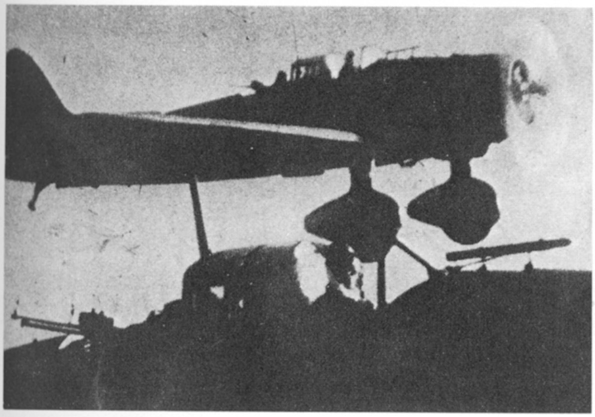
Beginning 11 January 1942, when the *Ryujo* air group covered the landing on Tarakan Island while the *Zuiho* air group performed similar duties for the invasion of Manado in the Celebes, eight Japanese carriers were involved in offensive operations. These included strikes against Rabaul by the air groups of the *Akagi, Kaga, Shokaku* and *Zuikaku,* which led to the invasion of Rabaul on 23 January, and on Ambon by the air groups of the *Hiryu* and *Soryu*. On 4 February, the latter two groups, together with land-based bombers, damaged the cruisers *DeRuyter, Houston* and *Marblehead* off Balikpapan. Eleven days later, B5N2s from the *Ryujo* failed to obtain any hits on a group of five cruisers and nine destroyers, and this lack of success was repeated on 26 February, when the air group used the same unsatisfactory medium-altitude bombing technique to strike at fast manoeuvring Allied cruisers. The *Ryujo* air group, however, proved successful in providing support to the Java invasion force, even though its B5N2s were still escorted by obsolete A5M4 fighters.

In preparation for the Java invasion, the First *Koku Kantai*, with the carriers *Akagi, Kaga, Soryu* and *Hiryu,* undertook a pre-emptive strike against Darwin and Broome in Australia. On 19 February, the four air groups launched eighty-one aircraft in support of fifty-three land-based bombers operating from Kendari. Nine out of ten USAAF P-40s trying to intercept them were shot down at the cost of a single D3A1, and carrier- and land-based bombers proceeded to smash all available targets. At the end of the raid fifteen Allied aircraft had been destroyed while five merchant ships, two small naval ships and one destroyer had been sunk, Moving back towards Java, the most experienced IJN carrier air groups searched for Allied shipping, and between 27 February and 2 March located and sank five warships and one merchantman to bring to a close their participation in the first phase of the Pacific war. By then Japanese forces occupied Siam, Malaya, the Philippines, the Dutch East Indies and New Britain.

The next offensive action mounted by the First *Koku Kantai* was even more successful and represented the only occasion on which its air groups were given an opportunity to seek and destroy enemy shipping on the open seas. Led again by Vice-Adm. Nagumo and made up of six carriers, with the *Ryujo* (now flying A6M2s instead of its old A5M4s) replacing the *Kaga*, which, in need of repairs, had been sent back to Kure, the First *Koku Kantai* left Staring Bay in the Celebes on 26 March and proceeded south of Java into the Indian Ocean. Before approaching Ceylon it split into two groups with the *Ryujo* and escort being assigned an anti-shipping strike between Madras and the Ganges Delta whilst the five other carriers were to attack harbours in Ceylon. Facing them was the Eastern Fleet of the Royal Navy, which, led by Adm. Sir James Somerville, included the carriers *Indomitable, Formidable* and *Hermes* (with a total of ninety-five aircraft), five battleships and escort. Fate, however, prevented these two powerful fleets from meeting head on and the experienced Japanese carrier air groups had to contend with only limited opposition from RAF aircraft. First spotted on 4 April when 415 miles from Ceylon, the five fast carriers launched 127 bombers and fighters before dawn the next day to raid dock, harbour and airfield installations around Colombo. Intercepted by thirty-six Hurricanes and six Fulmars, the attack force lost seven aircraft, but shot down sixteen British fighters and six Swordfish torpedo bomber biplanes prior to bombing their targets, where they sank a destroyer and an auxiliary vessel and damaged three other ships. Later in the day fifty-three D3A1s from the *Akagi*, *Soryu* and *Hiryu* bombed and sank the cruisers *Dorsetshire* and *Cornwall* sailing off the south coast of Ceylon. Meanwhile, *Ryujo* and her escort successfully hunted down shipping and her air group sank eleven vessels on 4 and 5 April, while the cruisers added another eight ships

Aichi D3A1s from the *Shokaku* air group (note white band around rear fuselage) lined up on a Japanese airfield shortly before the start of the war. (S. Bon)





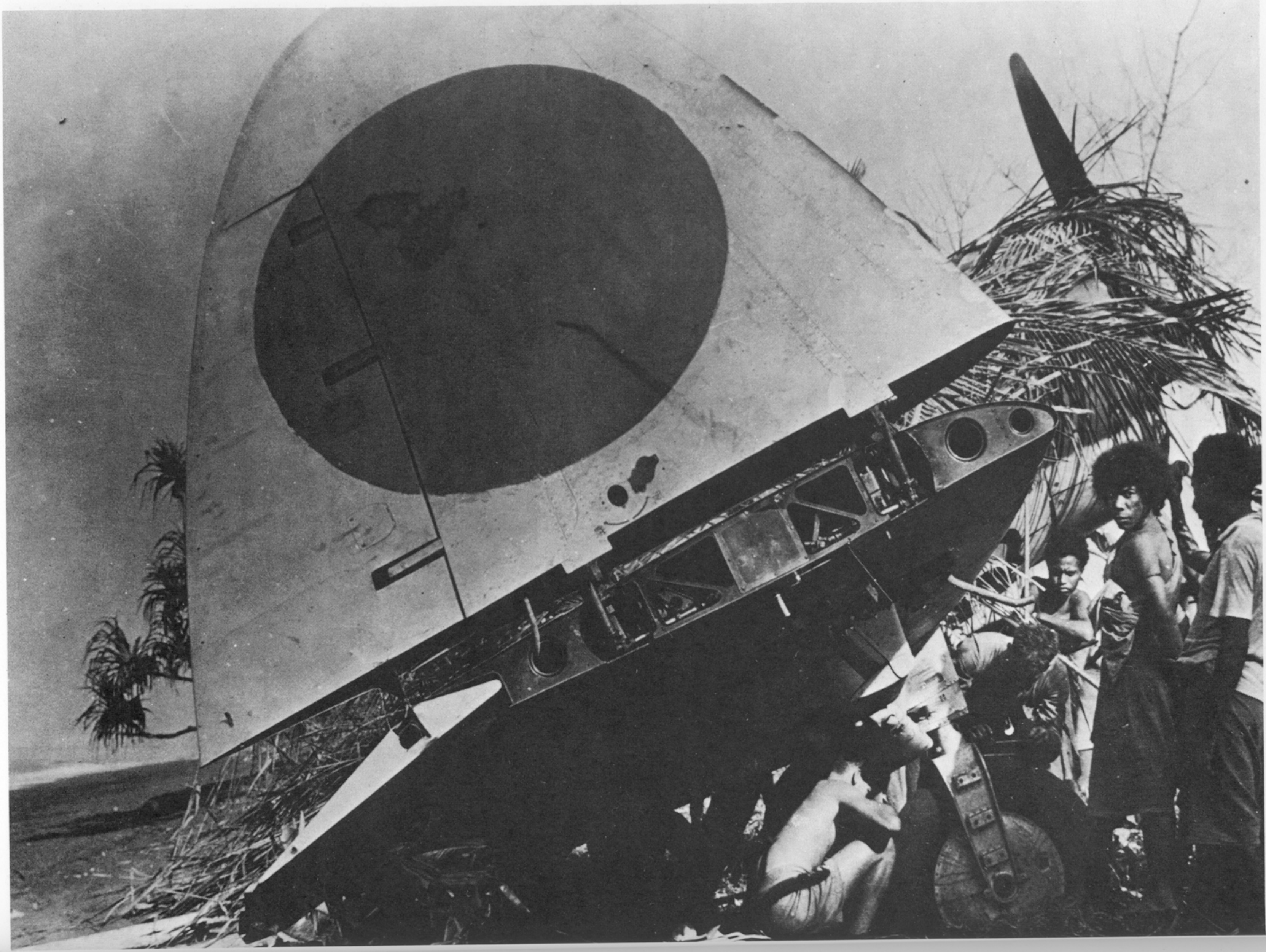
A pair of D3A1s in close formation. Details of the external bombsight and drum-fed Type 92 flexible rear-firing machine gun are clearly visible on the aircraft in the foreground.

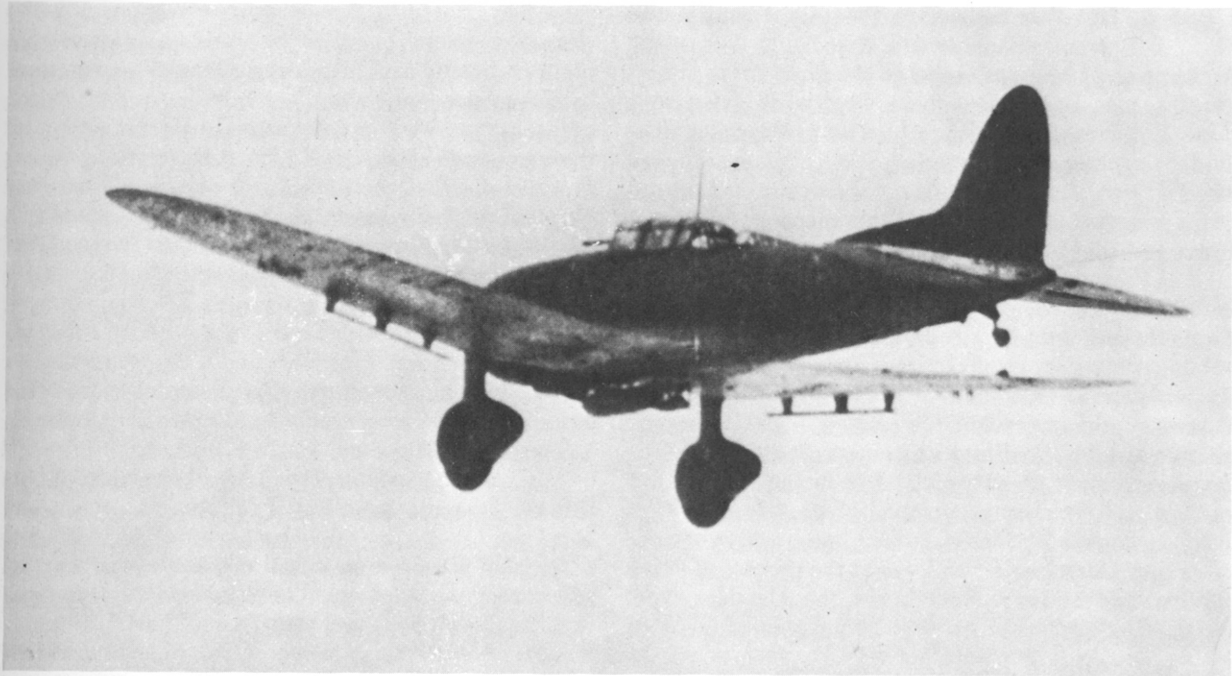
for a total British loss of some 90,000 tons. After refuelling at sea, the five fast carriers returned to the fray and attacked Trincomalee on 9 April. In the process their aircraft shot down nine British fighters for the loss of five aircraft (including two brought down by AA fire), but caused only relatively minor damage to shore installations. Again, however, the main success was achieved in a separate attack, when D3A1s caught the carrier *Hermes* at sea and sank her with no fewer than forty bomb hits. Also sunk in this battle off Ceylon were a destroyer, a corvette and two oilers, Japanese losses being only four dive bombers shot down by AA fire. Having achieved such results in less than a week, the First *Koku Kantai* turned east and headed back to Japan in preparation for the next offensive.

Already established on the north coast of New Guinea, the Japanese planned in the early spring of 1942 to continue their advance towards Australia, The first choice open to them was a land move across the Owen Stanley Range towards Port Moresby, but this operation was estimated to be excessively costly and slow. Accordingly, the High Command decided to proceed with an amphibious operation to be carried out, under the cover of land-based naval aircraft, by Vice-Adm. Inouye's Fourth *Kantai* (Fourth Fleet) and consisting of landings at Port Moresby and Tulagi in the Solomons. However, the knowledge that a powerful Allied fleet with at least two carriers was about to oppose this move forced the Japanese to postpone it temporarily until the Fourth *Kantai* could be reinforced with three carriers and their escort. The light carrier *Shoho* (twelve A6M2s and nine B5N2s) and the seaplane tender *Kamikawa Maru* (eight E8N2s), with an escort of four heavy cruisers, three light cruisers and seven destroyers, commanded by Rear-Adm. Goto, was to act as close escort whilst Rear-Adm. Hara's units—the battle carriers *Shokaku* and *Zuikaku* (forty-two A6M2s, forty-one D3A1s and forty-two B5N2s), two heavy cruisers and six destroyers—were to constitute the main striking force. Opposing them, under Rear-Adm. Fletcher, were the carriers *Yorktown* and *Lexington* (141 aircraft), eight heavy cruisers and eleven destroyers.

On 3 May 1942, under cover from the aircraft of the recently completed *Shoho*, Japanese troops landed on Tulagi and immediately set up a seaplane base for reconnaissance flying-boats and fighter floatplanes. However, on the next day the freshly set-up base was heavily damaged during a strike by the *Yorktown* air group, which was unopposed by the *Shoho* as the Japanese light carrier had been sent to Bougainville for fuelling. For the next two days the enemy fleets completed their fuelling, whilst their aircraft, assisted by land-based aircraft and floatplanes from the cruisers, attempted to locate each other, Finally, on the morning of the 6th, a Japanese flying-boat from Rabaul spotted the *Lexington* and the *Yorktown* and USAAF B-17s sighted and attacked, without scoring, the *Shoho*. The stage for the first carrier battle had been set. This historic event, which was preceded by the sinking on the morning of the 7th of the US tanker *Neosho* and destroyer *Sims* (twenty-five B5N2s from the *Shokaku* and *Zuikaku* had bombed the American ships from medium altitude without scoring, but thirty-six D3A1s from the same carriers proved successful), started badly for the yet unbeaten Japanese carrier air groups, as at 1112hrs, after surviving untouched an earlier attack by aircraft of the *Lexington,* the *Shoho* was hit by thirteen bombs, seven torpedoes and an aircraft. In less than ten minutes *Shoho* sank, to become the first of twenty Japanese carriers lost in the Pacific war. During the afternoon of the same day a search and strike mission by fifteen B5N2s and twelve D3A1s from the two Japanese battle carriers failed to locate the US carriers and lost all but four of its aircraft to US carrier planes and in the attempt to land in darkness and bad weather. Thus, by the end of the day, the balance of strength had passed into American hands.

Rising to the challenge, the diminished but still powerful *Shokaku* and *Zuikaku* air groups began to search for the *Lexington* and *Yorktown* immediately after dawn on the 8th. At about 0800hrs the search aircraft from both sides found their objectives and strike groups were launched (seventy-three US Navy aircraft versus sixty-nine IJN aircraft—twenty-four B5N2s and thirty-six D3A1s with an escort of nine A6M2s). The first attack was delivered at 1050hrs by the *Yorktown* air group, which, in spite of being intercepted by twenty-seven A6M2s on CAP, heavily damaged the *Shokaku* with three bomb hits. Half an hour later, the two Japanese carrier air groups finally evened out the tactical score by hitting the *Lexington* with three bombs and two torpedoes. Nine hours later the first US carrier was lost (the USS *Langley* had been sunk by land-based aircraft on 27 February 1942, but by then it was used as an aircraft transport not as a carrier). By then, however, the Japanese had abandoned the planned assault on Port Moresby, and their two carriers, the badly damaged *Shokaku* and the *Zuikaku*





From this angle, the elongated rear canopy was the primary recognition feature differentiating the improved D3A2 version from the original D3A1 version. (US Navy)

(which, including survivors from the *Shokaku*, was left with only thirty-nine aircraft—twenty-four A6M2s, six B5N2s and nine D3A1s), were retreating northwards. But, more important from the long-term point of view than the abandonment of the offensive against New Guinea, the Coral Sea battle ended for the Japanese carrier air groups with the failure to win their first confrontation with their US counterparts and with the loss of 107 aircraft and most of their experienced crews.

Whilst detailed planning for what became the abortive attempt to secure Port Moresby and the whole of New Guinea had been carried out, a major controversy regarding the next move to be undertaken flared between the Naval General Staff and the Combined Fleet. On one hand, to blockade Australia the General Staff favoured an amphibious operation against the New Hebrides and New Caledonia, whereas the Combined Fleet, under the forceful leadership of Adm. Yamamoto, advocated the conquest of Midway and the Western Aleutians to expand the Japanese defence perimeter, threaten and observe the Hawaiian Islands and, more importantly, to draw out the US carriers into a decisive battle, which the Japanese carrier air groups confidently expected to win. Following the daring daylight bombing of the Japanese mainland by the sixteen B-25 bombers of Lieutenant-Colonel Doolittle, which had been launched on 18 April 1942 from the carrier *Hornet*, the General Staff finally concurred with Adm. Yamamoto and authorized the attack on Midway. Yamamoto's carefully elaborated plan indeed succeeded in drawing out the US carriers and resulted in a decisive carrier battle. Unfortunately for Japan, a combination of events—including the American ability to break the Japanese naval code, lack of decision on the part of Vice-Adm. Nagumo, and plain bad luck—forced the decision in favour of the US Navy.

Close-up details of the manually folding starboard wing of a damaged Aichi D3A1 found in Papua by Allied forces. (US Navy)

Midway Débâcle

As a feint to distract American attention away from his main objective, Midway, and to establish observation bases on the Japanese northern flank, Adm. Yamamoto planned an attack against the Aleutians, which was to commence one day prior to the initial strike against Midway. However, unbeknown to him, the US Navy had broken the Japanese naval code and was thus able to concentrate its three carriers and supporting forces near Midway. Thus the defence of the Aleutians was left to a small garrison, to the USAAF (twelve P-40s, thirteen B-17s, four B-24s and twenty-four B-26s) and to three US Navy PBY flying-boat squadrons. Spearheading the Japanese forces in the area were the light carriers *Ryujo* (twelve A6M2s and eighteen B5N2s) and *Junyo* (eighteen A6M2s and eighteen D3A1s), two heavy cruisers and three destroyers, whilst the invasion fleet consisted of over thirty warships, transports and auxiliaries, and a distant support force included the light carrier *Zuiho* (twelve A6M2s and eleven B5N2s), four battleships, three light cruisers and three destroyers. The carriers *Ryujo* and *Junyo* left Ominato on 25 May and launched their first strike (fifteen A6M2s, nine B5N2s and twelve D3A1s) at dawn on 3 June. Bad weather en route enabled only twelve aircraft to find their target and, unopposed, these aircraft destroyed two PBYs and damaged oil storage and barracks. A second strike was even less successful, and among the Japanese losses was an A6M2 that made an emergency landing on Akutan Island. Its pilot was killed when the aircraft overturned, but the Zero-Sen was removed by American forces three months later and became the first example of the outstanding Japanese carrier-borne fighter to be tested by the Allies. The next day the *Ryujo* and *Junyo* air groups flew additional sorties, but, opposed by P-40s, lost several aircraft to bring total losses to nine aircraft out of their original strength of sixty-six. Later in the day the two carriers and their escort were called back to join Vice-Adm. Nagumo's fleet, which by then had already lost three of its four battle carriers and was in the process of losing the Battle of Midway. Nonetheless, the Aleutians expedition ended successfully with the occupation of Kiska on 6 June, and Attu on 7 June.

To attack Midway Adm. Yamamoto had assembled an extremely powerful fleet divided into a Striking Force, an Occupation Force and a Main Body. The latter, which included the training carrier *Hosho* (eight B5N2s), three battleships and eleven destroyers, was to provide distant protection, but did not actually take part in the battle. More significant to the course of events was the Striking Force, under Vice-Adm. Nagumo, which was made up of the carriers *Akagi*, *Kaga*, *Soryu* and *Hiryu*, and of two battleships, three cruisers and twelve destroyers. For combat operations the four carriers embarked a total of 227 aircraft (seventy-two A6M2s, seventy-two D3A1s, eighty-one B5N2s and two D4Y1-Cs—the latter type making its combat début in the reconnaissance role), whilst they also carried in storage twenty-one A6M2s, which were to be sent to Midway to form part of the Japanese garrison after the planned occupation of the island. Facing them, but not expected by the Japanese command, were the *Enterprise*, *Hornet* and *Yorktown*, with a total of 232 aircraft, as well as 119 Midway-based aircraft from the USAAF, USMC and USN.

Japanese air operations in this battle began at 0430hrs on 4 June, when 108 aircraft led by Lt.-Cdr. Tomonaga were launched to strike at Midway, whilst the *Soryu* sent its two new D4Y1-Cs to supplement E13A1 floatplanes from the cruisers in search sorties to locate the American fleet. Even though the A6M2s easily disposed of the intercepting USMC fighters, the strike aircraft failed to inflict sufficient damage to Midway and Lt.-Cdr. Tomonaga was forced to recommend that a second strike against the island be sent. Meanwhile, Nagumo's command had successfully fought off attacks by small goups of B-17s, B-26s and TBFs from the land-based American air units. Nonetheless, Nagumo found himself in a dilemma: should he accede to Tomonaga's request and order his remaining aircraft to attack the island or, as his fleet had been located and could thus expect to be soon under attack by US carrier-borne aircraft, should he keep his aircraft available to strike at the American carriers as soon as his reconnaissance aircraft could locate them? As at first the Japanese search aircraft failed to locate the US task force Nagumo finally ordered his aircraft to be rearmed with bombs for land targets in place of the torpedoes and armour-piercing bombs with which they had been loaded in anticipation of a strike against the US fleet. However, whilst rearming activities were taking place, a first US carrier was spotted at 0820hrs and a change in weapons once again became urgent, as it was now clear that a second strike against Midway would have to wait until after the US fleet was neutralized.

Albeit understandable, especially when one remembers that the Japanese command anticipated that only one or two American carriers would be in the area, Nagumo's lack of decision proved to be a fatal mistake, as rearming was still in progress when the US carrier-borne aircraft began their attacks. At 0925hrs a first group of American torpedo bombers began to engage the Japanese carriers, but this attack, as well as those of two other TBD squadrons, were easily repulsed by the A6M2s on CAP, which shot down thirty-five out of forty-one US torpedo bombers as well as three of their escorting Wildcats. In the process, however, the Japanese fighters exhausted their fuel and ammunition and were forced to land back on their carriers, where their arrival added to the scene of confusion. Thus, when at 1022hrs the first American dive bombers went after the Japanese carriers, few A6M2s remained on CAP, while the carriers' decks were jammed with closely parked aircraft, most of them fully fuelled and bombed-up, and with bombs and torpedoes left from the rearming operations. These highly tempting targets soon felt the full impact of determined attacks by SBDs and by 1030hrs the *Kaga*, *Akagi* and *Soryu* had taken fatal blows and only the *Hiryu* was still in a condition to carry on the battle.

At 1100hrs *Hiryu* launched a strike composed of eighteen D3A1s and six A6M2s and, after fighting their way through the American CAP, eight of the dive bombers scored three hits on the *Yorktown*. Led by Lt.-Cdr. Tomonaga, who gallantly took off on a one-way mission as his B5N2's fuel tanks had been damaged in the attack on Midway and thus contained insufficient fuel for returning to his carrier, a second strike (ten B5N2s and six A6M2s) by the *Hiryu* air group resulted in two torpedo hits on the *Yorktown*, which doomed the American carrier. Later in the day, however, the two undamaged USN carriers launched additional strikes, and in the late afternoon *Hiryu* was fatally wounded. Thus, through no fault of their own,

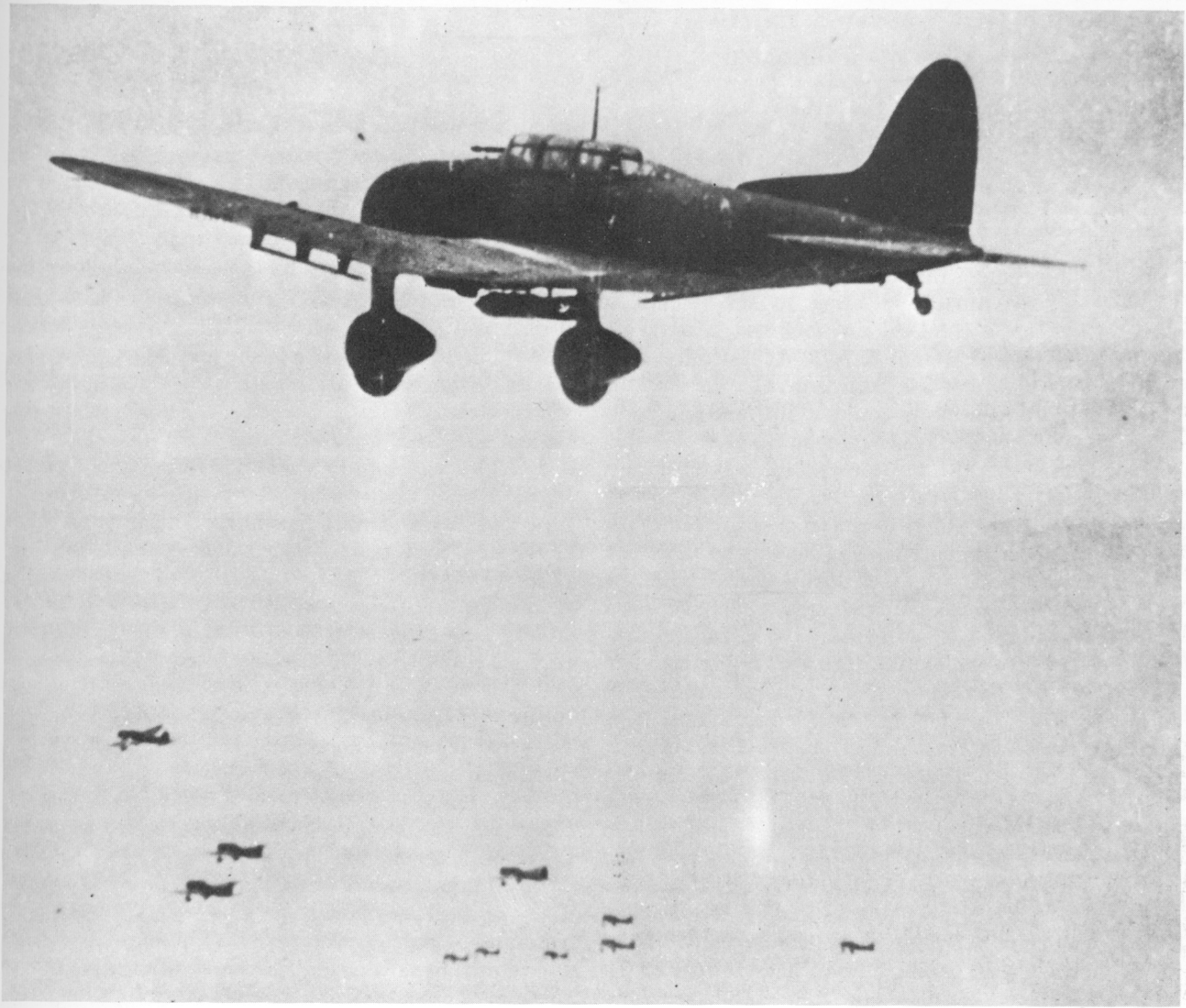
A formation of D3A2s in flight over the Solomons. The bomb installation beneath the fuselage and the underwing dive brakes, which rotated 90 degrees into the airstream to steady and slow the aircraft into near vertical dives, are noteworthy. (US Navy)

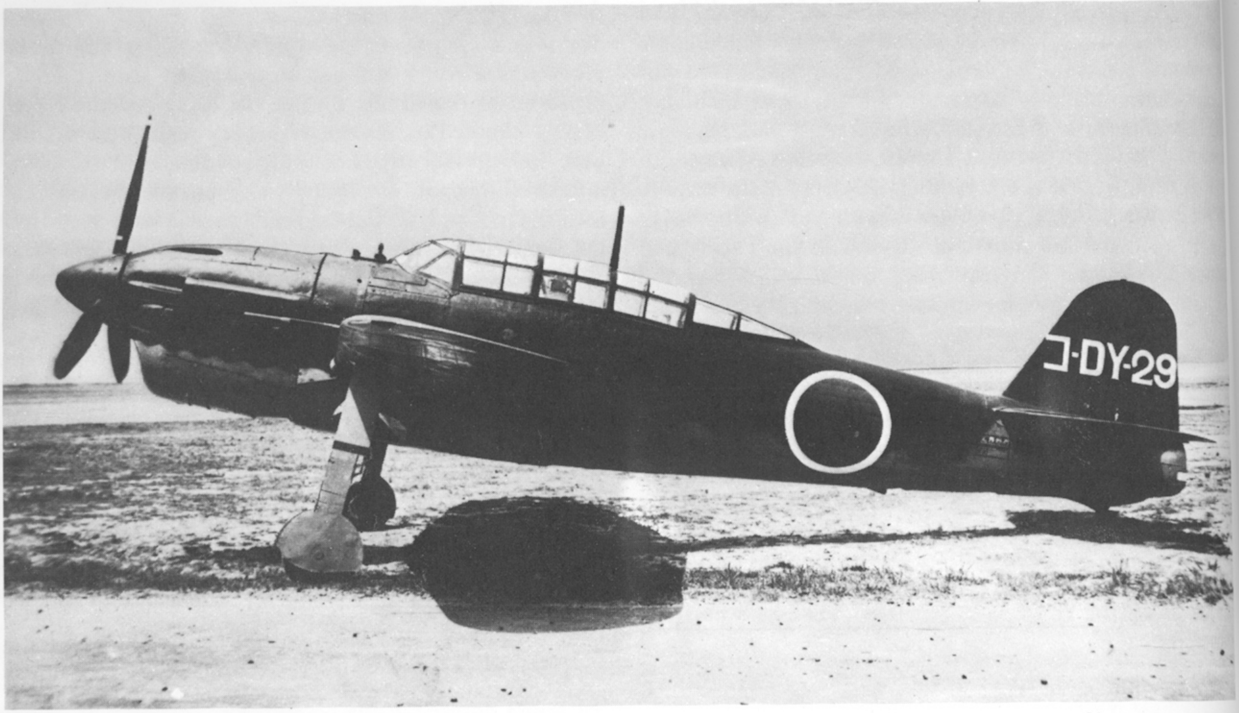
the four Japanese air groups lost all of their carriers, and most of their aircrews whilst succeeding only in sinking the *Yorktown* and in inflicting moderate damage to installations on Midway (in terms of aircraft losses, including US land-based and carrier-borne aircraft, and Japanese cruiser- and carrier-based aircraft, respective losses ran five to three against the Japanese). Deprived of the carriers in its Striking Force, the *Rengo Kantai* had no alternative but to retreat. The course of the war in the Pacific had taken a dramatic turn in favour of the Allies and the Japanese air groups were no longer the mighty hunters.

* * *

The defeat at Midway left the Imperial Japanese Navy in a state of chaos far beyond that associated with the already crucial loss of four battle carriers. Particularly grievous was the loss of its most experienced air groups (those of the *Shokaku* and of the *Zuikaku* had never quite reached the level of operational effectiveness achieved some time prior to Pearl Harbor by the air groups of the *Akagi, Kaga, Soryu* and *Hiryu*), a loss from which the service never recovered. True, it still had more carriers than could be deployed in the Pacific by the US Navy and the Royal Navy combined and its carrier-borne aircraft were still the best in service anywhere. However, Japan's limited industrial output combined with insufficient training facilities to supply its fast-increasing needs for aircrews left the Imperial Japanese Navy in a dangerous situation. During the forthcoming seven months it suffered further losses in air groups and was unable to stop the first Allied offensive in the Solomons in spite of the gallant efforts of its aircrews and sailors.

Under the protection of Vice-Adm. Fletcher's Task Force 61 (carriers *Enterprise, Saratoga* and *Wasp* with supporting warships), the First Marine Division landed on Tulagi and Guadalcanal in the Solomons at dawn on 7 August 1942. At that time the Japanese carrier air groups were in the Inland Sea, where they were reorganized and





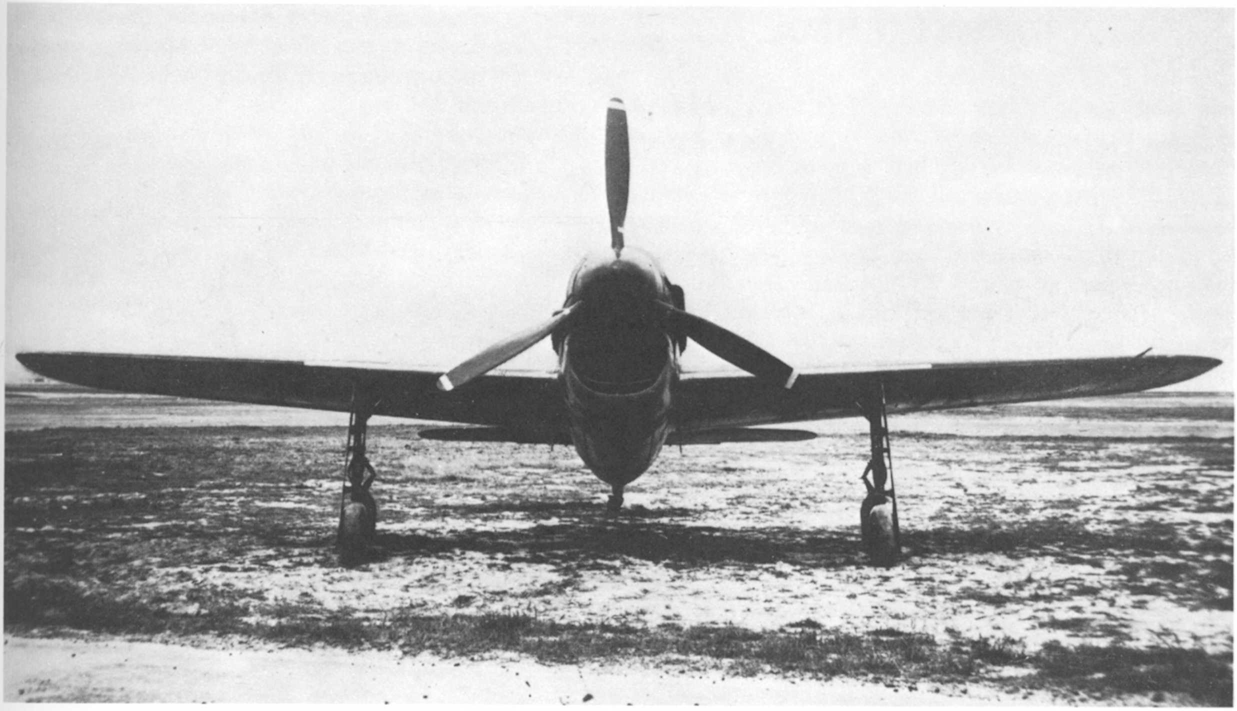
Designed at the First Naval Air Technical Arsenal, Yokosuka, the Suisei (Comet) was an extremely clean aircraft, which, in its initial versions, was powered by a liquid-cooled engine. The example illustrated is a development aircraft photographed during service trials.

trained to incorporate the lessons painfully acquired at Midway. Thus, initial opposition to the American offensive was left to the local garrisons and to naval air groups based in and around Rabaul. At last, nine days later, the *Rengo Kantai* left the Inland Sea for Truk to provide cover for transports bringing Japanese reinforcements to Guadalcanal and to engage the US Fleet. For this operation three carriers and escort were divided into a Mobile Force, under Vice-Adm. Nagumo, and a Diversionary Force, under Rear-Adm. Hara, whilst additional warships were assigned to various support groups. The Mobile Force, which was essentially tasked with the responsibility for engaging the US carriers, was comprised of the *Shokaku* and *Zuikaku* air groups (with a total of fifty-three A6M2s, fifty-one D3A1s, thirty-six B5N2s and two D4Y1-Cs), two battleships, four cruisers and twelve destroyers. The Diversionary Force, which was to strike American forces on Guadalcanal, included one cruiser, two destroyers and the *Ryujo* air group (twenty-one A6M2s and sixteen B5N2s). By the afternoon of 23 August these two forces, which operated separately, were some 300 miles north of Guadalcanal and were fast closing on the two carriers of Vice-Adm. Fletcher (*Saratoga* and *Enterprise* with 174 aircraft, while *Wasp* and her seventy-nine aircraft had been detached for refuelling purposes) in preparation for what became known as the Battle of the Eastern Solomons.

Sixth Carrier Loss

At 1330hrs on 24 August, after both sides had earlier in the day supplemented reconnaissance sorties by land-based aircraft and seaplanes with search missions by carrier-borne aircraft, *Ryujo* launched the first Japanese strike of the battle when she dispatched six B5N2s and fifteen A6M2s to attack Henderson Field, the Marine airfield on Guadalcanal from which operated Wildcats of VMF-223 and Dauntlesses from VMSB-232. Already by then the Japanese light carrier had been located by a PBY and American carrier-borne aircraft were winging their way to attack her, whilst, after being sighted themselves, the *Zuikaku* and the *Shokaku* prepared to launch strikes against the carriers of Task Force 61. The first of these strikes, consisting of twelve A6M2s, nine B5N2s and twenty D3A1s, departed at 1540hrs and followed some of the *Enterprise*'s search aircraft to locate the American carrier. However, before they were able to do so, the Imperial Japanese Navy lost its sixth carrier when *Saratoga*'s Dauntlesses and Avengers struck the *Ryujo* with four bombs and one torpedo, beginning at 1620hrs. Once again, the battle between opposing carrier air groups began badly for the Japanese.

Vastly outnumbered (there were fifty-three Wildcats on CAP as well as numerous other American aircraft returning to their carriers after search and strike sorties) and spotted by radar far in advance of its targets, the first strike by the *Shokaku* and *Zuikaku* air groups fought its

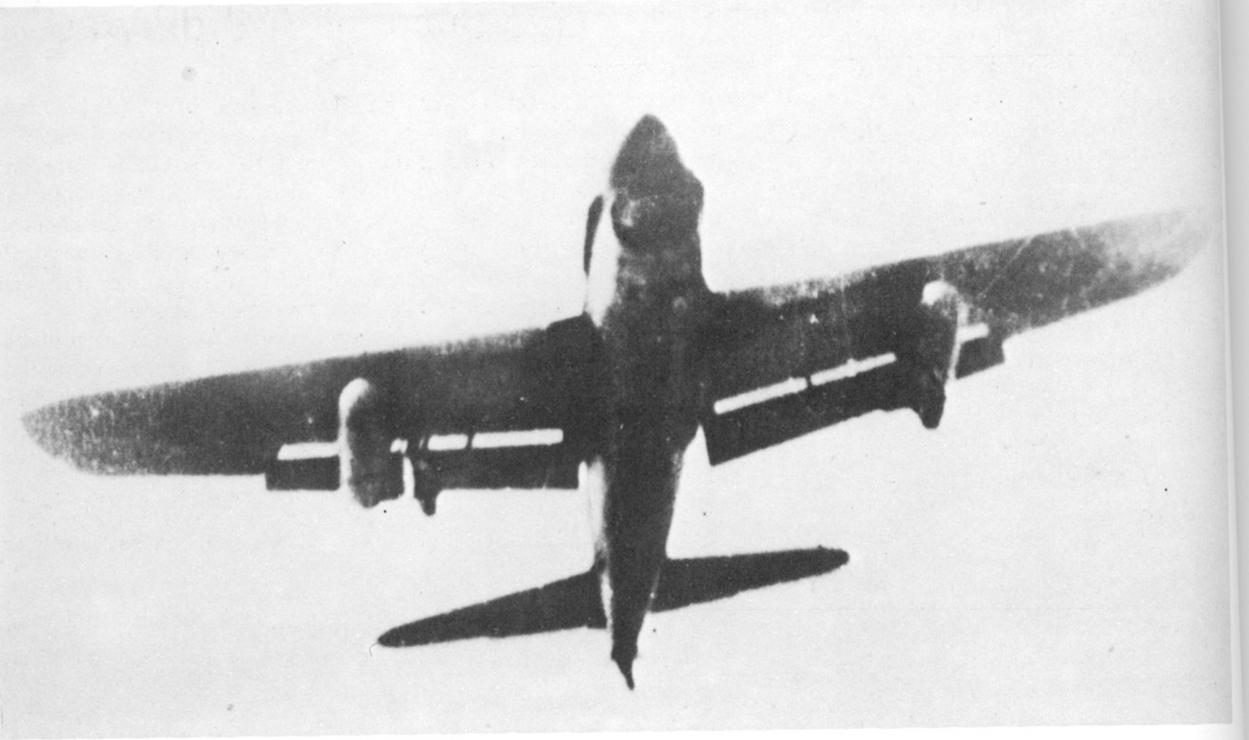


Front view of an Atsuta 12-powered D4Y1 with its characteristic shark-like radiator. The inboard portion of the wing leading edge is painted yellow to facilitate identification.

way towards the *Enterprise*. Losing many aircraft in the process, but being saved from complete destruction by poor radio procedures followed by American fighters, the Japanese air groups reached the *Enterprise* at 1711hrs, when D3A1s scored three hits and three near misses to inflict serious damage and heavy casualties. None of the B5N2s was able to reach the American carrier, which, with its flight deck out of commission, was able to fight its fires (on the next day the *Enterprise* steamed back to Pearl Harbor for repairs). The price paid by the attackers had been heavy and was further increased when surviving aircraft were attacked on their way to their carriers by Dauntlesses. The second Japanese strike, which consisted of three A6M2s, nine B5N2s and eighteen D3A1s, was even less successful as it failed to locate either the damaged *Enterprise* or the fully battle-worthy *Saratoga* and was forced to turn back at 1857hrs. Several of its aircraft were lost due to fuel starvation and, at the end of the day, the third carrier battle left the Imperial Japanese Navy with yet another heavy drain on its carrier air groups, including the loss of one carrier and of some eighty aircraft and most of their crews. It also forced the Japanese to recall their transports before they could land the sorely needed reinforcements for the Guadalcanal defenders. In retrospect, this defeat can be blamed on the division of forces and on the piecemeal deployment of aircraft in small strike units, which placed the Japanese air groups at an unreasonable numerical disadvantage which could not be offset by the gallantry of their aircrews.

After the Battle of the Eastern Solomons, the Imperial Japanese Navy retained in the Pacific a clear advantage in terms of aircraft carriers as it had at its disposal the battle carriers *Shokaku* and *Zuikaku*, the light carriers *Hiyo*, *Junyo* and *Zuiho*, the escort carriers *Taiyo* and *Unyo*, and the training carrier *Hosho*, whereas the Pacific Fleet only had the *Hornet*, *Saratoga* and *Wasp*, as well as the damaged *Enterprise*. This advantage was further increased by Japanese submarines, which damaged the *Saratoga* on 31 August and sank the *Wasp* on 15 September, but was offset in the second half of October by the return to sea, following repairs, of the *Enterprise*. Prior to this last-mentioned event, the air groups aboard the light carriers *Hiyo* and *Junyo* had obtained some success against an American supply convoy for Guadalcanal when, on 15 October, their D3A1s sank the destroyer *Meredith* and, on the next day, badly damaged the seaplane tender *McFarland* and destroyed most of its precious cargo of aviation fuel.

Two and a half months after the American landing on Guadalcanal, the Japanese High Command decided to launch a joint Army–Navy operation to expel the US Marines from the Solomons. On Guadalcanal the Imperial Japanese Army was to mount a land offensive to capture Henderson Field and thus wrest local air superiority from the Americans. At sea the Imperial Japanese Navy was to provide support to the land forces with two battleships, four cruisers, fourteen destroyers and the light carriers *Hiyo* and *Junyo*, under the command of Vice-Adm. Kondo, whilst the US Navy and its remaining carriers



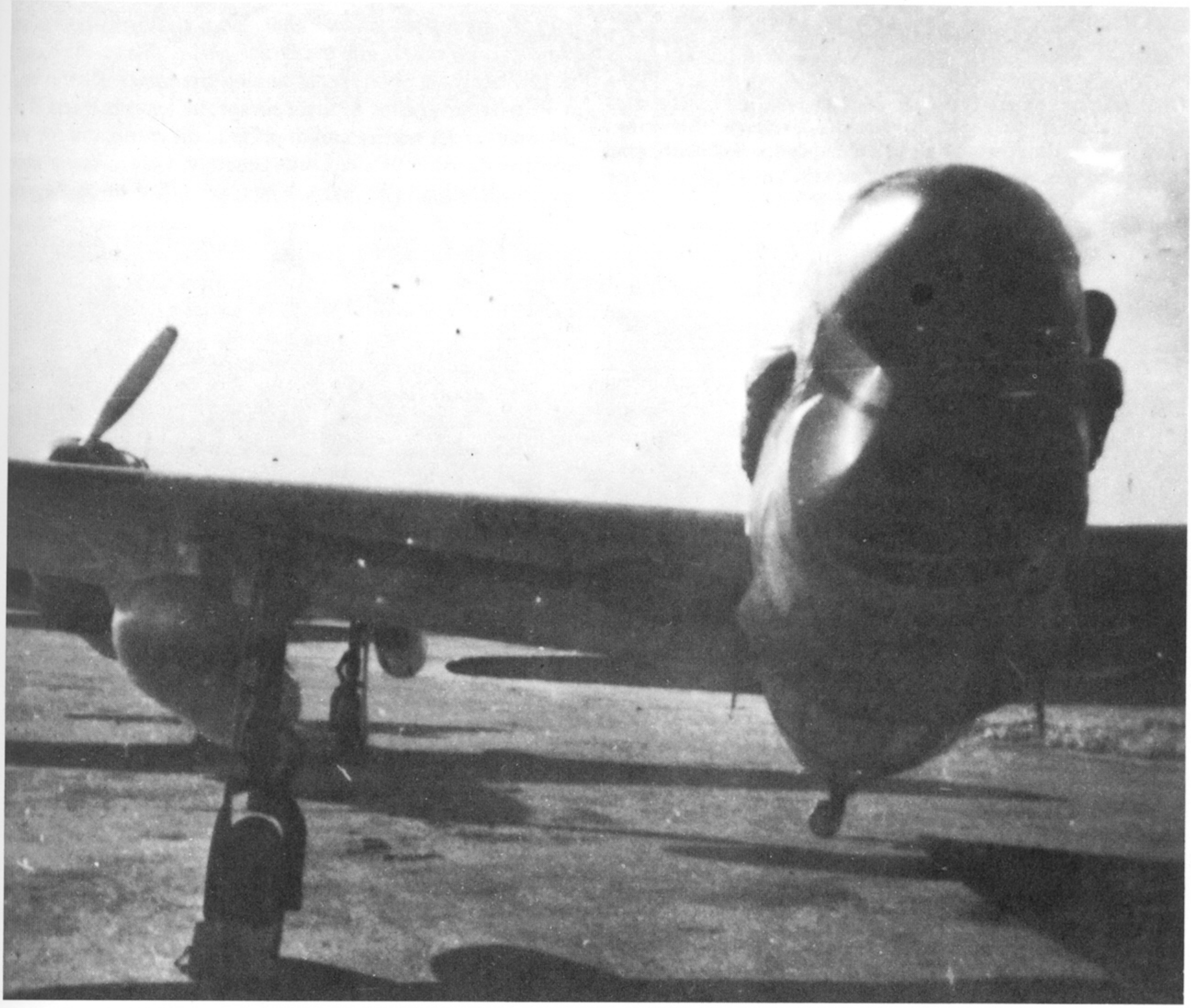
Due to wing flutter problems which developed during dive-bombing tests, the initial production Suiseis were fitted as carrier-borne reconnaissance aircraft. Two of these D4Y1–Cs made the type's combat début during the Battle of Midway, when they were embarked aboard the *Soryu*. (Real Photographs)

were to be engaged by the carriers *Shokaku, Zuikaku* and *Zuiho*, one cruiser and eight destroyers (Vice-Adm. Nagumo), and a Van Force (Rear-Adm. Abe) with two battleships, four cruisers and seven destroyers. Even though, due to mechanical troubles, *Hiyo* was forced on 22 October to withdraw to Truk after flying off her air group to Rabaul, the Japanese had total numerical superiority, as the US Navy had only the *Enterprise*, the *Hornet*, one battleship, six cruisers and fourteen destroyers. In terms of carrier-borne aircraft the two larger US carriers embarked a total of 169 aircraft versus 207 aircraft aboard the Japanese flat-tops (seventy-five A6M2/3s, forty-five D3A2s and forty-two B5N2s aboard Nagumo's three carriers, and eighteen A6M2s, eighteen D3A1s and nine B5N2s aboard the *Junyo*). After the Japanese land offensive had had to be postponed twice, these forces met in the Solomons on 26 October to fight the Battle of Santa Cruz, the last victory won by the Japanese carrier air groups.

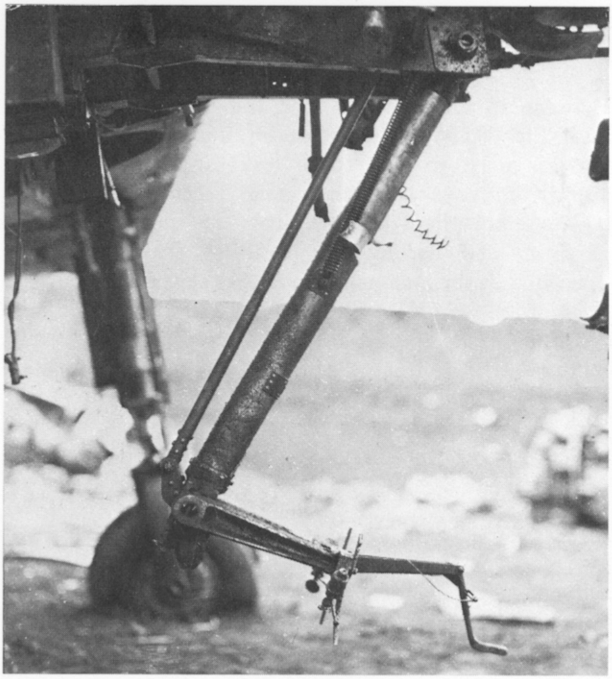
In the early morning hours of 26 October the enemy fleets launched search and strike sorties to pinpoint the location of the carriers which they knew operated in the area. The first sighting was made at 0730hrs and immediately Nagumo's three carriers launched a first strike of sixty-two aircraft. Shortly afterwards the Japanese CAP intercepted a pair of Dauntlesses which had spotted their carriers, but failed to prevent the SBDs from passing their sighting report and from escaping. Counter-strikes were immediately dispatched by the US carriers and the battle was on. The first hit was obtained by SBDs flying an armed search, which, at 0830hrs, spotted and bombed the *Zuiho*. The Japanese light carrier was hit by two bombs and had her flight deck put out of action. Forty minutes later *Shokaku* and *Zuikaku* launched a second strike of forty-two aircraft and for the rest of the day a fierce and confusing battle was fought, with enemy formations criss-crossing the sky between the two fleets and engaging each other as well as striking their targets. The CAPs on both sides were kept busy, but neither the Japanese nor the Americans were able to prevent their respective carriers from being hit. Albeit at an excessive cost in terms of aircraft and aircrews, the Japanese carrier air groups distinguished themselves in the offensive as, beginning at 1010hrs, the first strike group hit the *Hornet* with four bombs, two torpedoes and two aircraft. Still afloat but listing badly, the *Hornet* survived for a few hours, but at 1600hrs she took another torpedo hit during a composite strike by *Shokaku* and *Junyo* aircraft. *Hornet* was doomed and had to be abandoned, to be finally sunk during the night by torpedoes from Japanese destroyers. The second Japanese strike began attacking the *Enterprise* at 1105hrs and the D3A2s scored three hits to damage the carrier heavily but without putting it out of action. An hour later, a strike by the *Junyo* air group failed to score and *Enterprise* succeeded in reaching Noumea, where temporary repairs were made in just two weeks. The Japanese carrier air groups also damaged the battleship *South Dakota*, the cruiser *San Juan* and the destroyer *Smith*. In the defensive role, these groups were less successful as, in addition to failing to stop the bombing of *Zuiho*, they could not prevent aircraft from the *Hornet* scoring six hits on the *Shokaku*, which was forced to withdraw northwards. By the end of the afternoon, having destroyed the *Hornet* and seriously damaged the *Enterprise* while still retaining two undamaged carriers (*Zuikaku* and *Junyo*) as well as half of their aircraft, the Japanese carrier air groups were poised to achieve complete victory. However, the low fuel status of many of the Japanese warships, the failure of the Imperial Japanese Army to secure Henderson Field and thus eliminate the threat posed by land-based US aircraft, and the cautiousness of Vice-Adm. Nagumo robbed them of this last chance in the war as the fleet returned to Truk.

Guadalcanal Withdrawal

Between 11 and 15 November, the *Hiyo* and the *Junyo*, with fifty A6M3s, twenty-seven D3A2s and eighteen B5N2s, were given a triple task: attacking American supply convoys to Guadalcanal, escorting Japanese convoys bringing reinforcements to the Guadalcanal garrison, and seeking and attacking Task Force 16, operating in the area with the hastily repaired *Enterprise*. Such orders were tall ones for these air groups, which were mostly made up of inexperienced aircrews, and the results reflected this situation. At the hands of Marine fighters from Henderson Field, the two air groups began by losing some fifteen aircraft in an unsuccessful attack on Allied shipping and then proceeded to lose at least as many



Standard bomb-load for the D4Y1 and D4Y2 versions was a single 250kg bomb carried internally in a fuselage bay. In addition, light bombs could be carried beneath the wing. (US Navy)

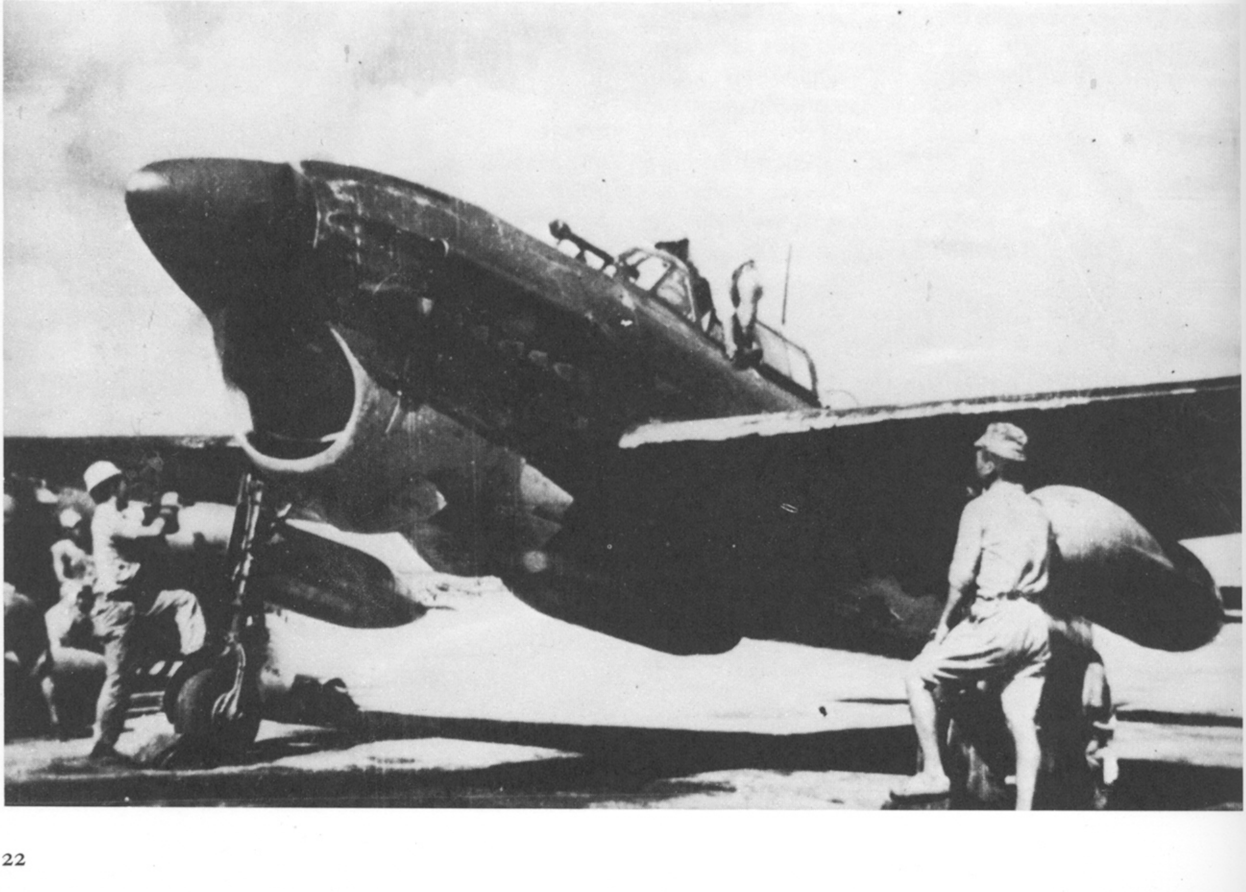


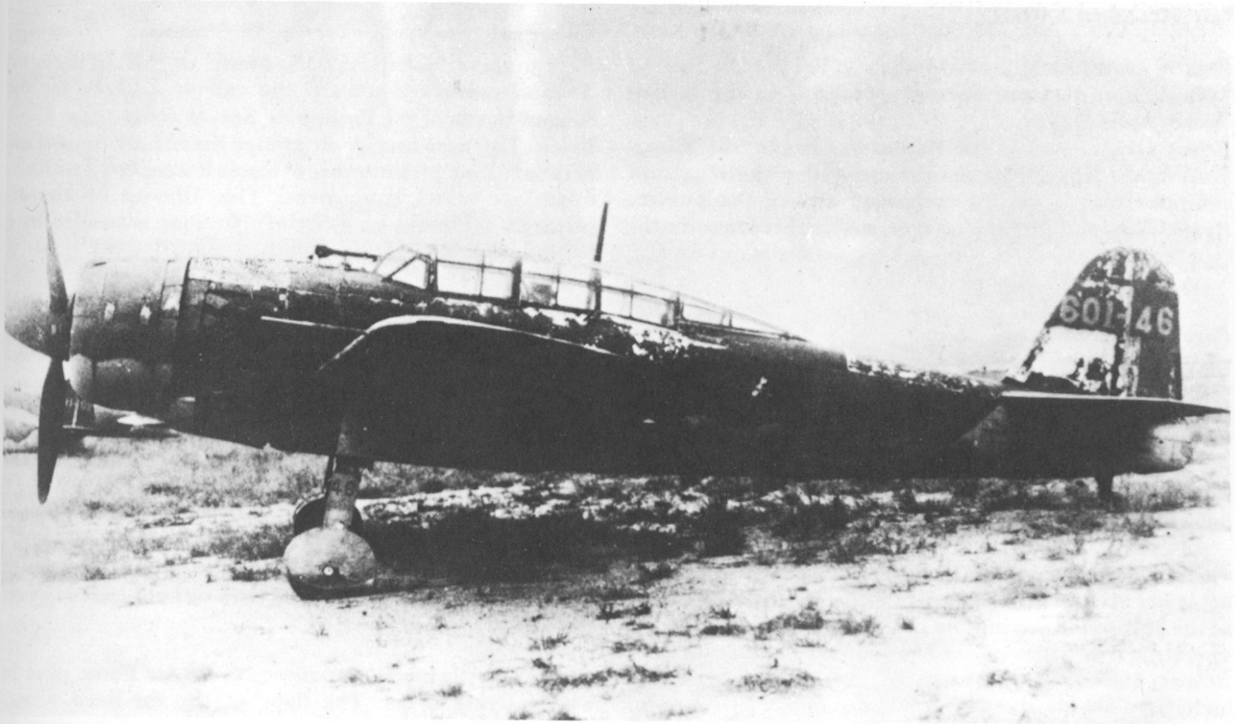
Left
To clear the propeller during dive-bombing operations, the Suisei's internally carried bomb was attached to a retractable yoke, shown here in its fully extended position.

aircraft again in trying to protect their own convoy and the Japanese warships that attempted to shell Guadalcanal. At no time did their aircraft threaten the *Enterprise* and the five-day action ended with the failure of the last major Japanese attempt to reconquer Guadalcanal. On 8 February 1943 the island was finally secured by the Americans and the savage battles for Guadalcanal had drained the Japanese carrier air groups of their remaining experienced aircrews. A further drain occurred during the following fifteen months, when these groups were repeatedly depleted of aircraft and crews to reinforce land-based units. Thus, when in June 1944 the next carrier battle was fought off the Marianas, the Japanese carrier air groups were but a shadow of their former glory.

On 18 April 1943 Adm. Isoroku Yamamoto, Commander-in-Chief of the *Rengo Kantai*, was killed when the G4M1 bomber he was flying in for an inspection tour in the Solomons was shot down by P-38s operating from Guadalcanal. His successor, Adm. Mineichi Koga, immediately set about reorganizing the *Rengo Kantai* and its carrier air groups to incorporate the lessons learned in the first carrier battles and to prepare his command for yet another decisive battle. Unfortunately, before being able to complete his task, Adm. Koga was killed on 27 March

Internal fuel capacity of the Suisei was normally supplemented by two 330-litre tanks beneath the wing. However, as illustrated below, a third drop tank could also be carried semi-recessed in the fuselage bay in place of the bomb. (US Navy)





1944 when his flying-boat crashed during a storm whilst en route from Palau to Davao. His task, however, was continued by Adm. Soemu Toyoda, who succeeded him in command of the *Rengo Kantai*.

After the heavy losses incurred at Midway and during the carrier battles in the Solomons, new air groups were formed to re-equip the surviving carriers and to fit out the new carriers entering service. Most of these groups, however, were promptly transferred to land bases to sustain the Japanese resistance in the Solomons and thus few of their crews survived the prolonged battle of attrition to cadre the reorganized and enlarged air groups embarked aboard the Japanese carriers in the spring of 1944. Furthermore, lack of fuel forced a drastic limitation on operational training flights thus leaving the crews with insufficient experience. Fortunately, this situation was partially offset by the availability of substantially better aircraft, with the Yokosuka Suisei replacing the Aichi D3A2 in the dive-bombing role and the Nakajima B6N2 Tenzan supplementing the veteran B5N2 torpedo bomber. Only the Zero fighter, albeit in its improved Model 52 version, remained from the original complement of the Japanese carrier air groups. Moreover, these aircraft, instead of being assigned to small air groups embarked

continued on page 34

The Atsuta engine, a licence-built version of the German DB601 liquid-cooled engine, powering the D4Y1 and D4Y2 versions was enclosed in a remarkably smooth cowling, contributing to the Suisei's excellent performance. (US Navy)

At the time of the Second Battle of the Philippine Sea the 601st *Kokutai* was partially equipped with D4Y3s. One of these aircraft, which landed in the Philippines after being launched from one of the Japanese carriers, is seen here as it was found by Allied forces.

KEY TO COLOUR PAGES:

Page 25 *above*: Aichi D3A1 Model 11, 'Val', of the Second *Koku Sentai*, depicted during operations in the Indian Ocean, April 1942.
Below: Obsolete when the Pacific war began, the Mitsubishi A5M4 (Navy Type 96 Carrier Fighter Model 24) still equipped the air groups embarked aboard the carriers *Ryujo*, *Zuiho* and *Hosho*. However, within three months the type was relegated to training and ancillary duties. (US Navy)

Page 26 *above*: For use against land targets or merchant vessels, the Navy Type 97 Carrier Attack Bomber could be armed with 800kg of small bombs carried, as shown by this B5N1 of the Yokosuka Naval Air Corps, on six racks beneath the fuselage.
Below: Mitsubishi A6M2 Model 21, 'Zeke', of the Second *Koku Sentai* at the time of the Battle of the Eastern Solomons, August 1942.

Page 27 *above*: Yokosuka D4Y2 Model 22, 'Judy', of the 601st *Kokutai* aboard the carrier *Taiho* for the First Battle of the Philippine Sea in June 1944, where the type made its operational début as a carrier-borne dive bomber.
Below: After a programme of strengthening, which included work on the wing structure and the fitment of improved dive brakes, the D4Y2 Suisei became an effective carrier-borne attack aircraft. (Maru)

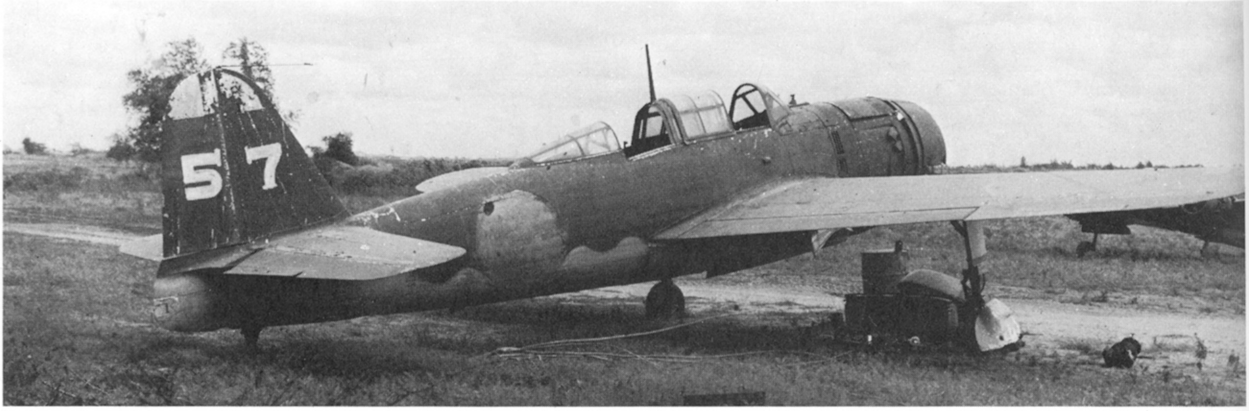
Pages 28–29: Nakajima B5N2 Model 12, 'Kate', of the First *Koku Sentai*, First *Koku Kantai*, Pearl Harbor attack force, 7 December 1941.

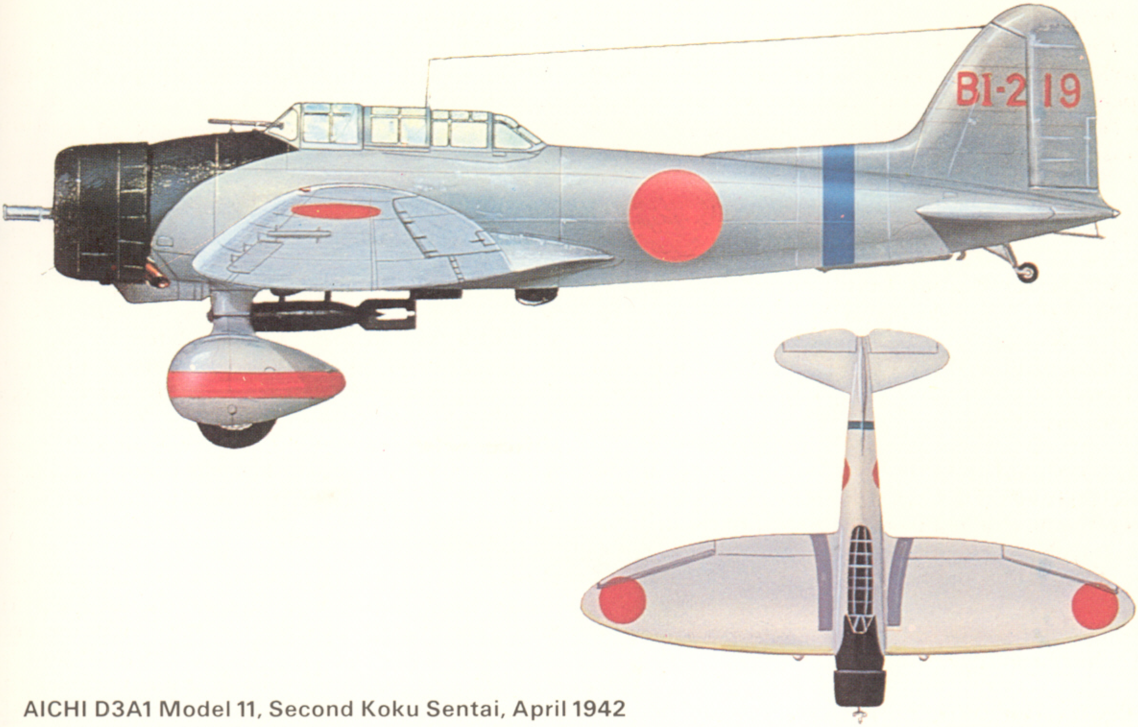
Page 30 *above*: Nakajima B6N2 Model 12, 'Jill', of the 653rd *Kokutai* embarked aboard the carrier *Zuikaku* for the Second Battle of the Philippine Sea, October 1944.
Below: Japanese carrier air groups made only limited use of radar although a number of aircraft were fitted with air-to-surface-vessel equipment. This line-up of aircraft pictured at Atsugi on 6 September 1945 is headed by a B6N2 with wing and fuselage antennae. (USAF)

Page 31 *above*: IJN carrier identification markings: (A) *Akagi* (B) *Kaga* (C) *Soryu* (D) *Hiryu* (E) *Ryujo* (F) *Shoho* (G) *Taiyo* (H) *Shokaku* (I) *Zuikaku*. Colour identification was as follows: red, 1st Carrier Division; blue, 2nd CD; none, 3rd CD; yellow, 4th CD, and white, 5th CD. Aircraft fin markings consisted of an initial letter to identify the carrier division, and a Roman numeral to show the carrier's position within the division (I: 1st, II: 2nd, etc.). After the hyphen came a three-digit number to identify the type of mission and the individual aircraft.
Below: A refuelling bowser, believed to be an adaptation of a 2-ton Isuza TX40 cargo truck, used by land-based IJN air units.

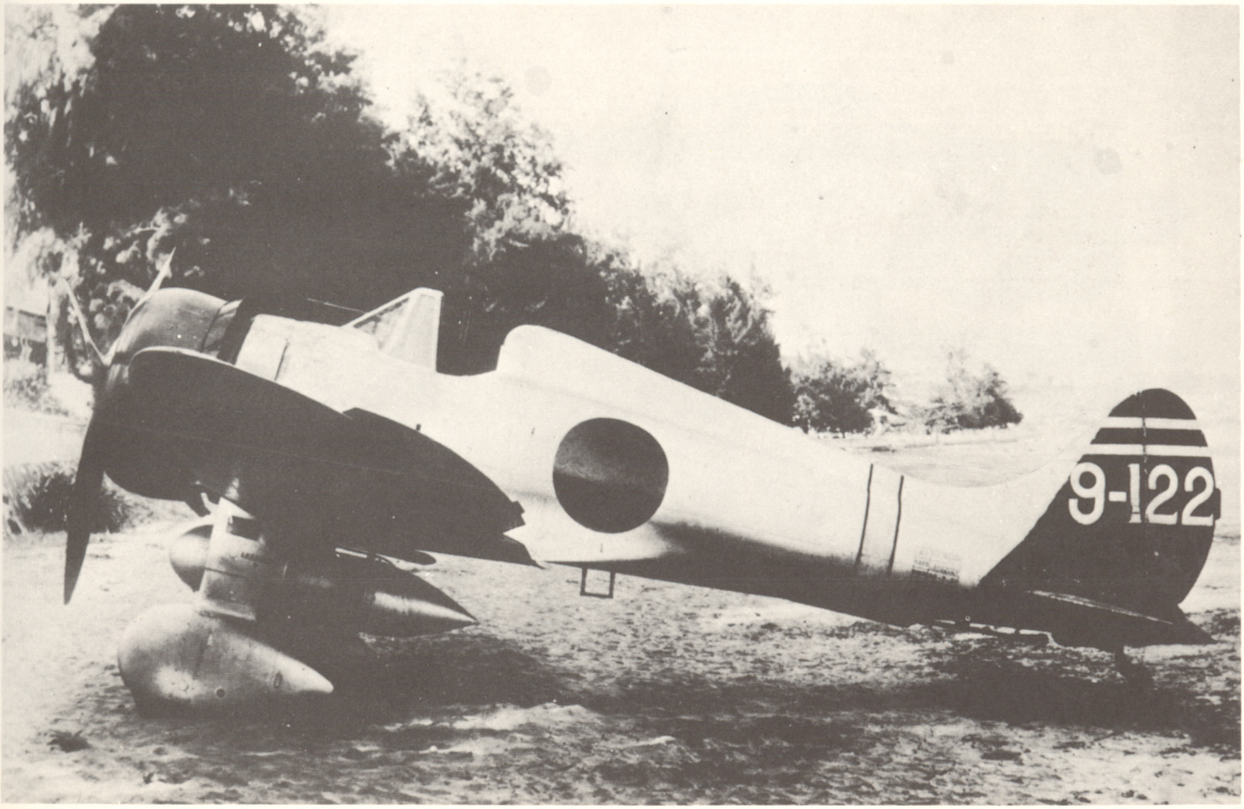
Page 32: (1) Imperial Japanese Naval Air Force pilot in winter flying dress. The flaps of the fur-lined winter helmet were often worn like this when out of the aircraft, to judge by photographs. The heavy lined suit has a national patch on the right shoulder and the ranking patch of Junior Lieutenant on the left arm. The kapok-filled lifejacket is worn beneath the parachute harness.
(2) Petty Officer 3rd Class of the IJNAF, in normal naval rating's summer fatigues of white linen, and the hat of his rank. A variety of overalls and suits in white material were worn by deck crews; when handling aircraft a white version of the standard Japanese field-cap was worn, with a blue anchor badge. The arm patch identifies the branch and grade—an aircraft symbol in a wreath.
(3) Fighter pilot in lightweight summer flying suit; note pocket and button detail. The helmet is also the unlined brown summer type. The rank patch of Petty Officer 1st Class is worn on the left breast here; photographs show such patches being worn either on arm or breast.

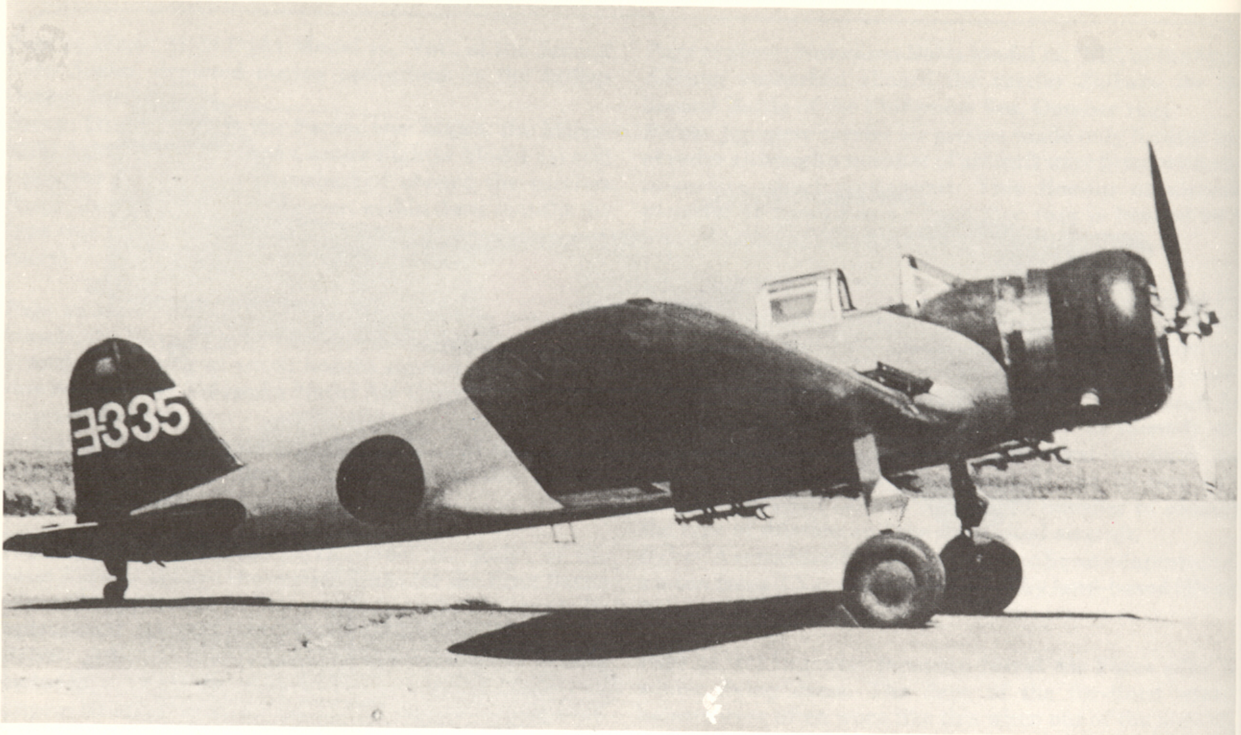
Navy Type Suisei Carrier Bomber Model 33 (Aichi D4Y3) captured in the Philippines. More reliable than the Atsuta engine powering early Suisei versions, the Kinsei 62 radial engine of the D4Y3 was smoothly faired into the narrow fuselage. (US Navy)

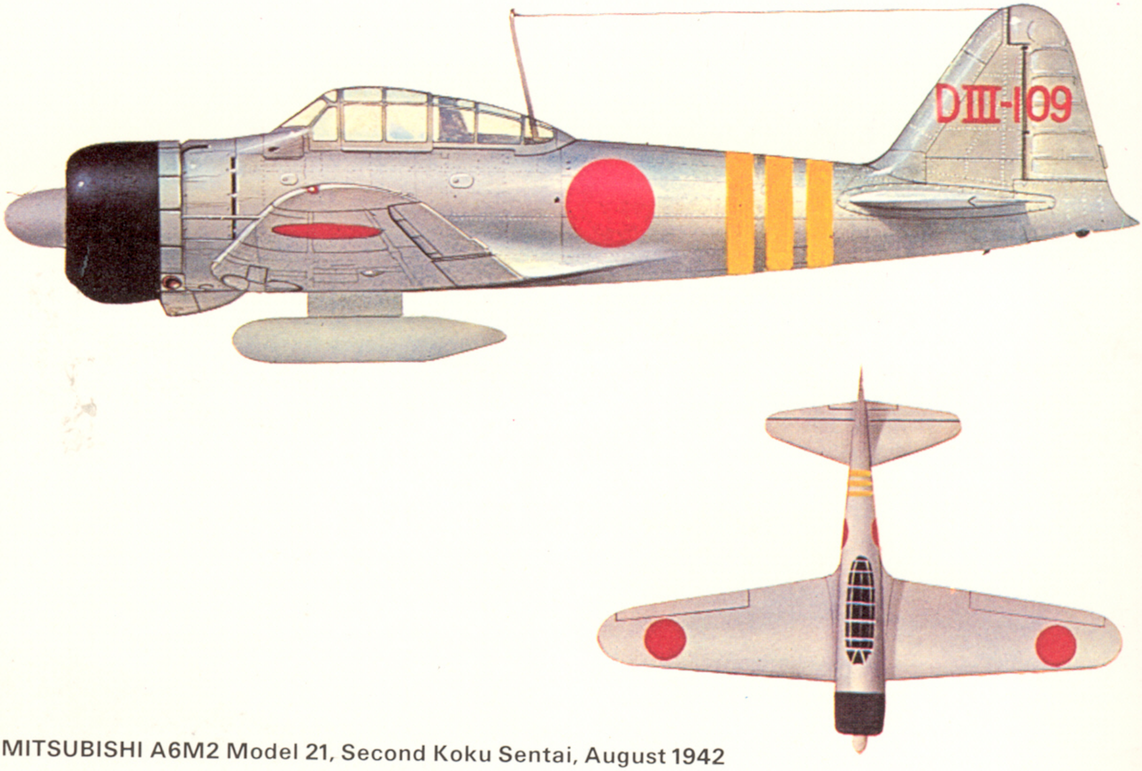




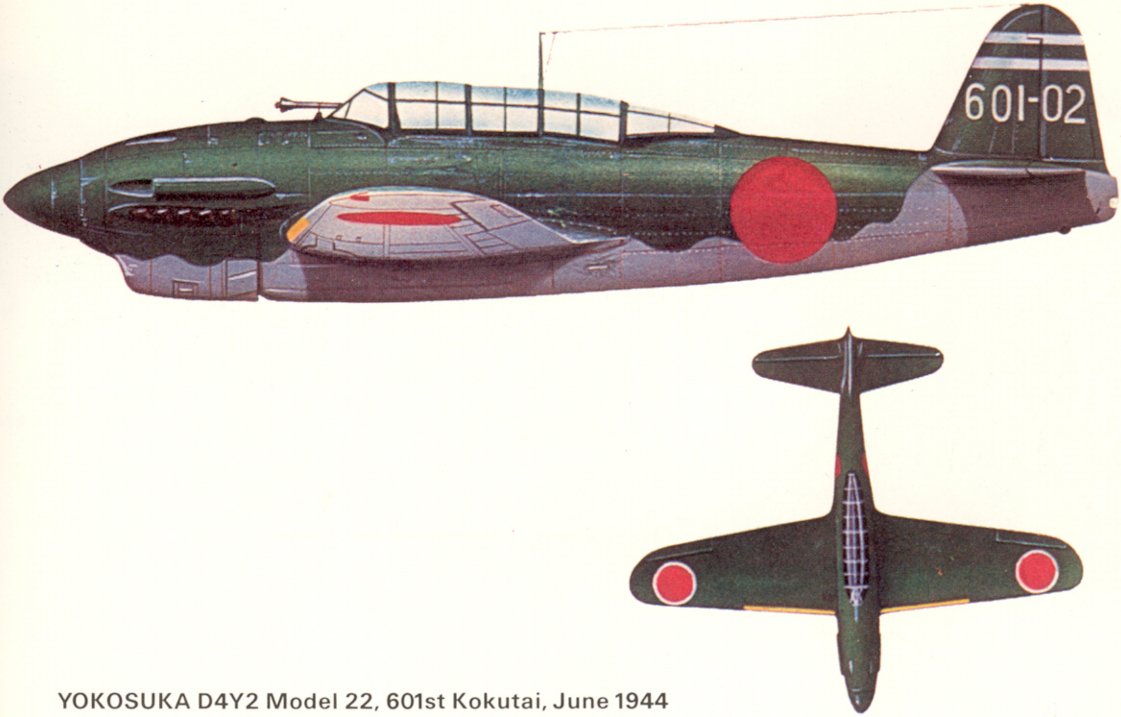
AICHI D3A1 Model 11, Second Koku Sentai, April 1942



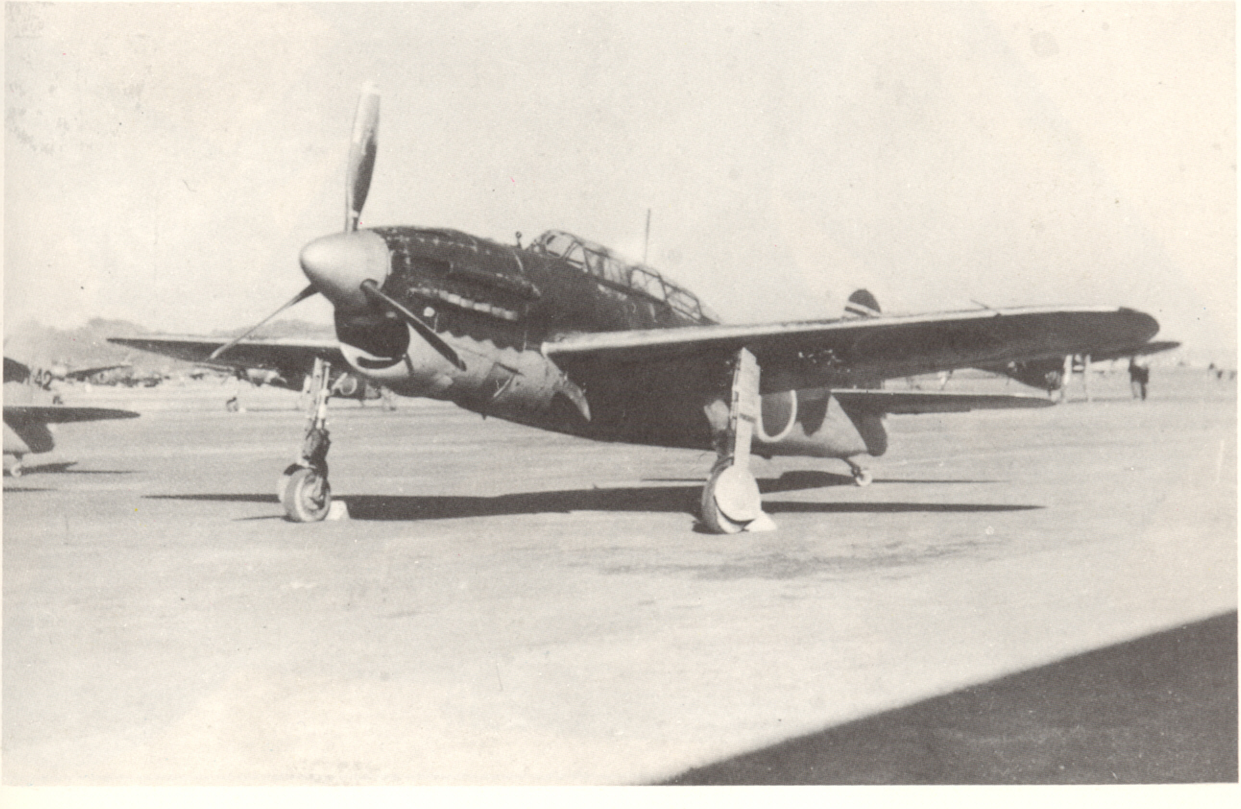


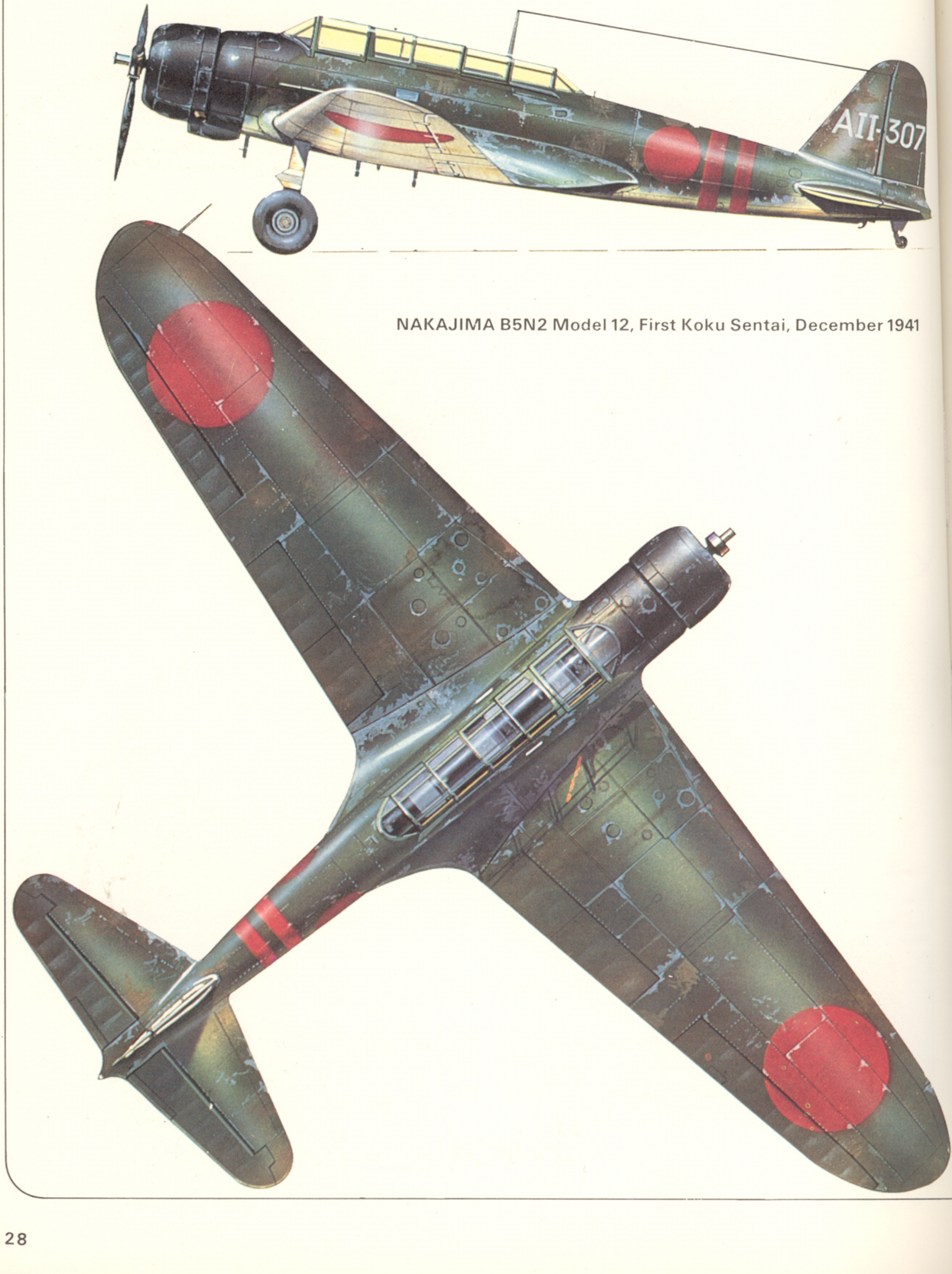


MITSUBISHI A6M2 Model 21, Second Koku Sentai, August 1942

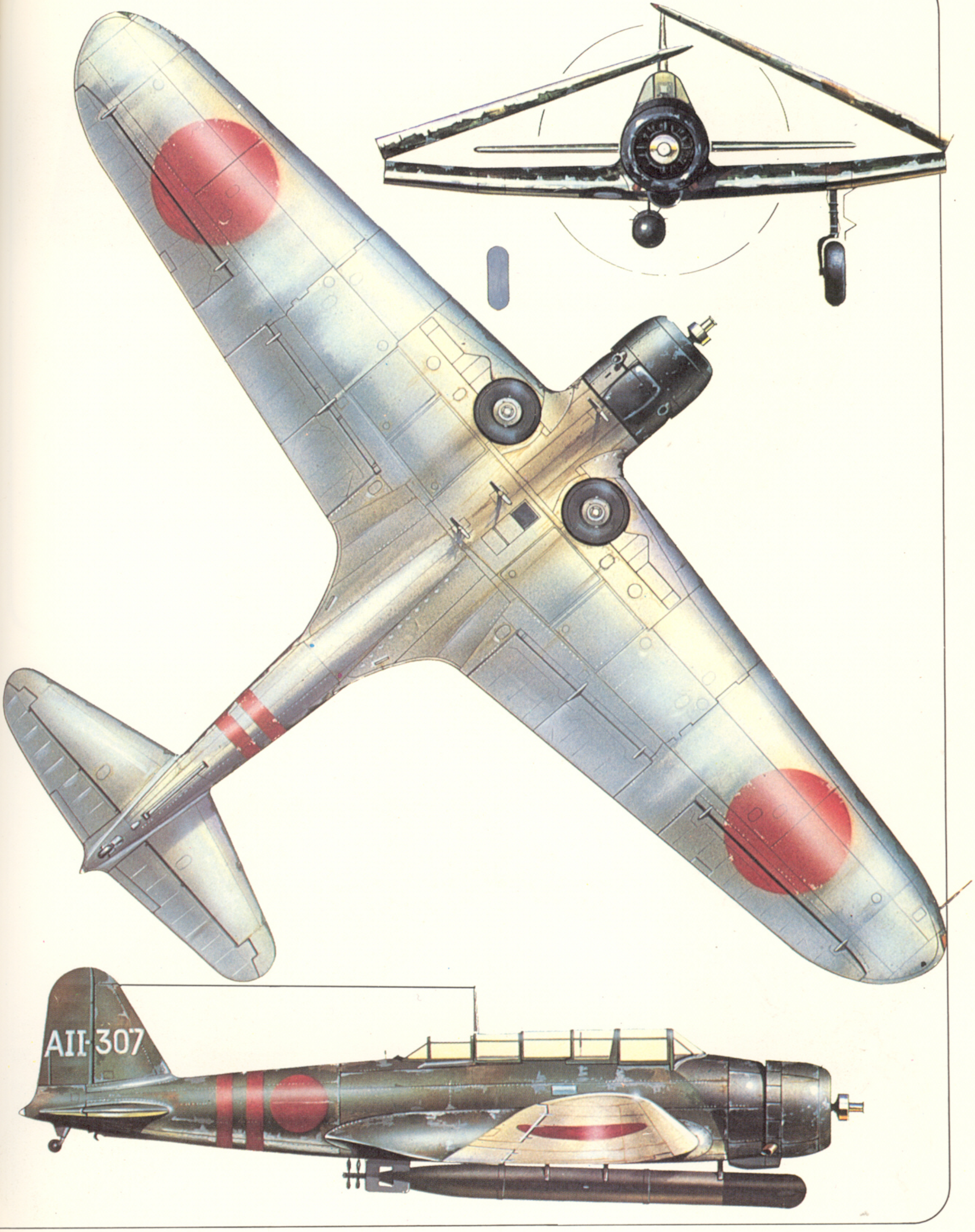


YOKOSUKA D4Y2 Model 22, 601st Kokutai, June 1944





NAKAJIMA B5N2 Model 12, First Koku Sentai, December 1941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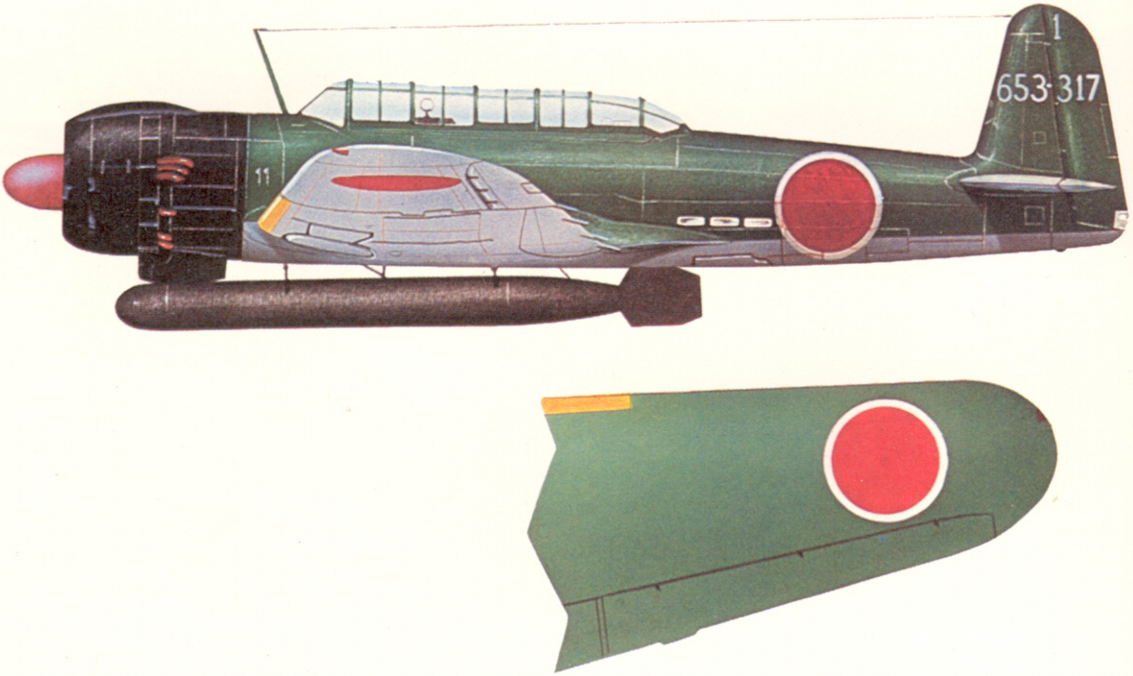
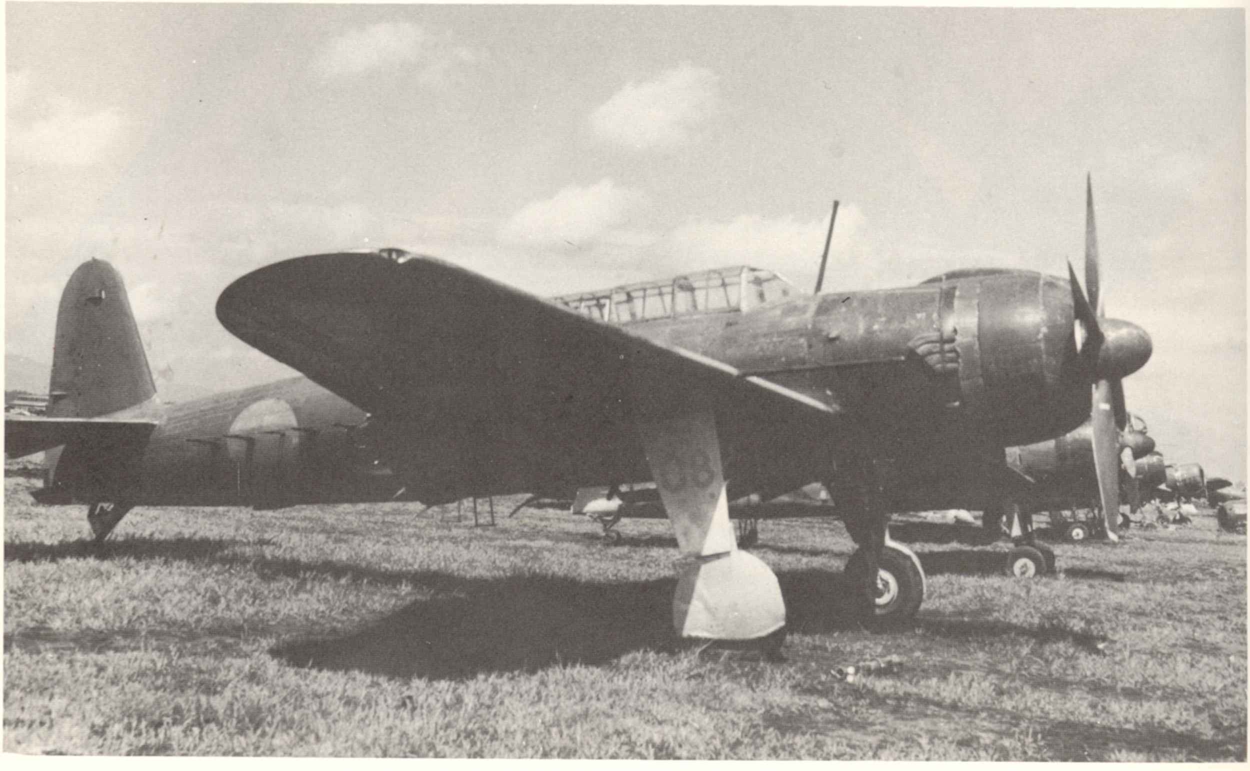
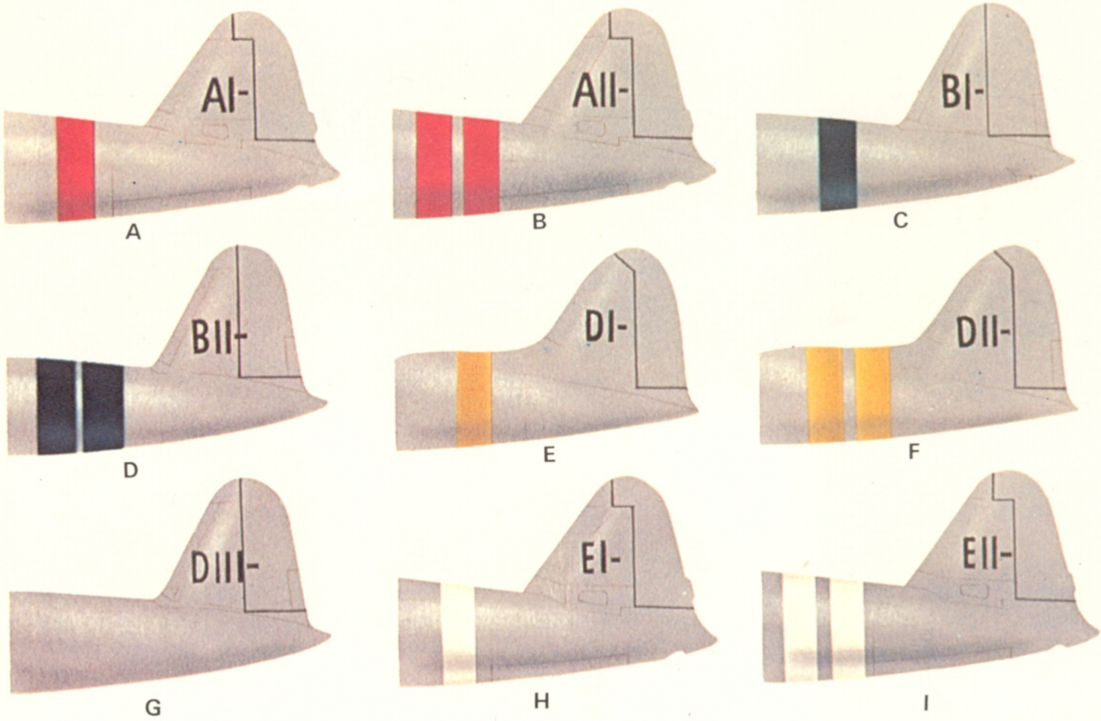
NAKAJIMA B6N2 Model 12, 653rd Kokutai, October 1944



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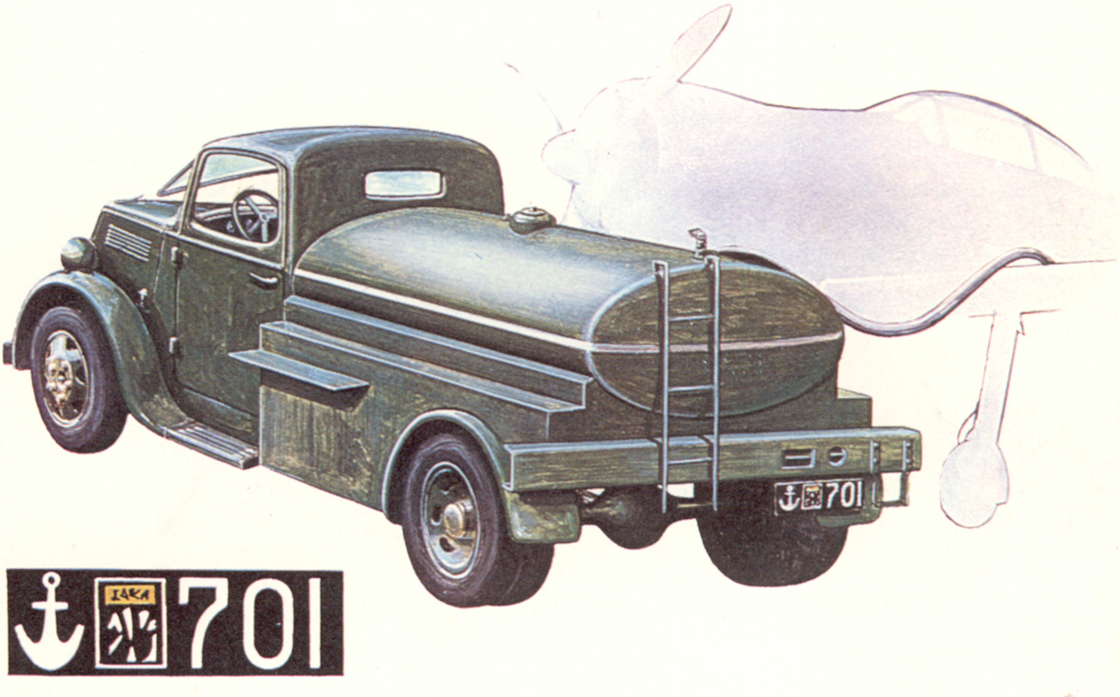
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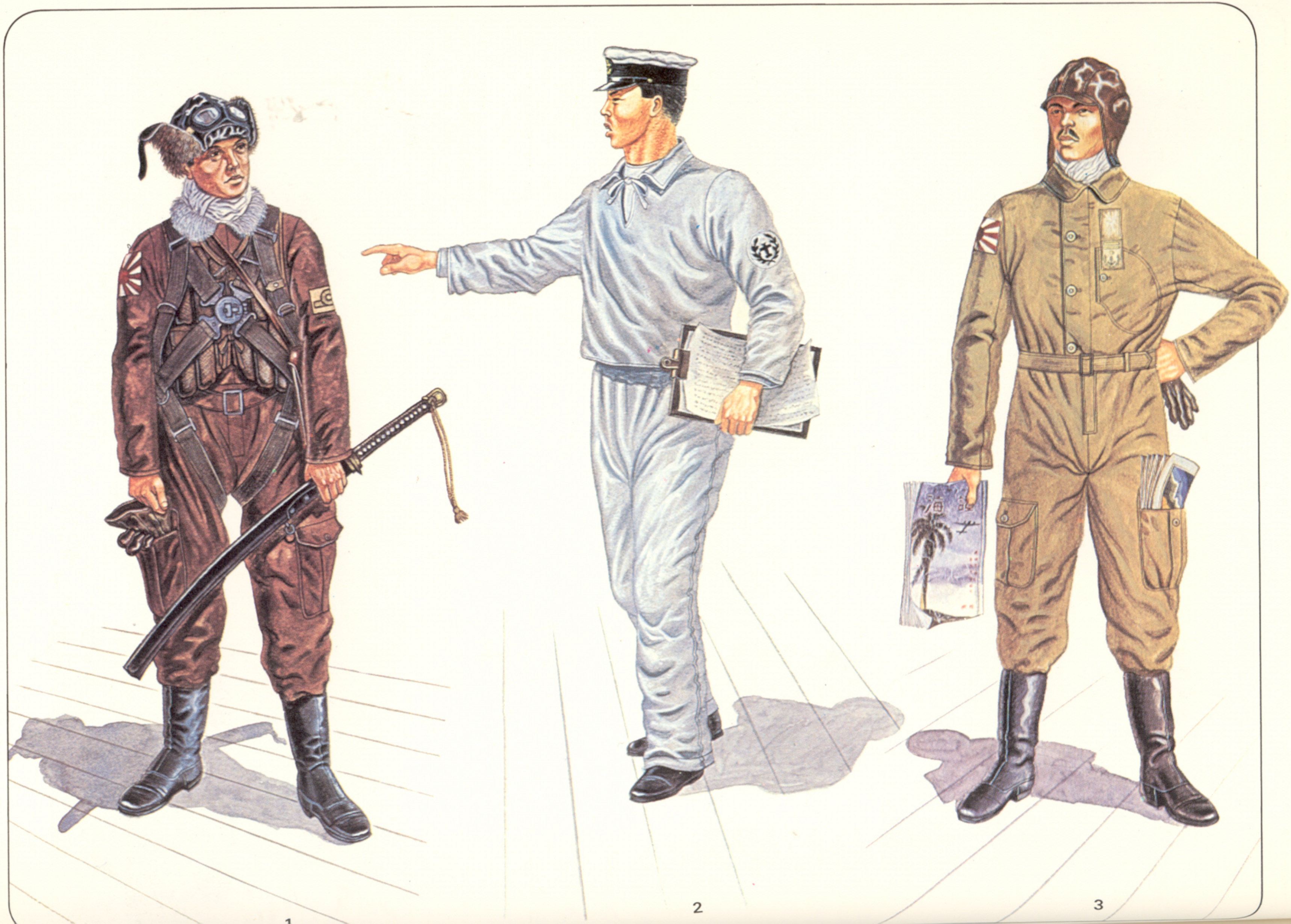
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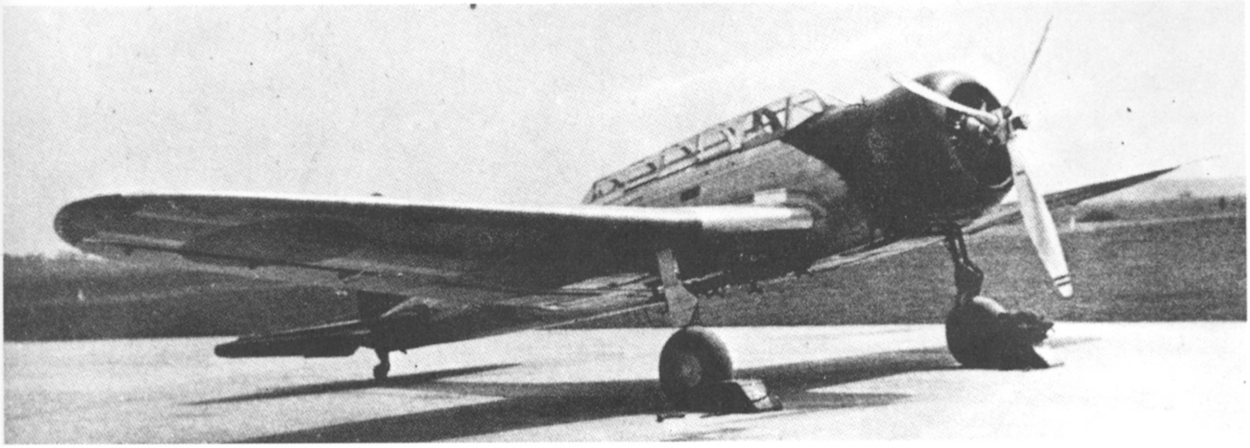
Characteristics and Performance of major Japanese Carrier Aircraft, 1941–45

	Mitsubishi A6M2	Mitsubishi A6M5	Aichi D3A1	Yokosuka D4Y2	Nakajima B5N2	Nakajima B6N2
Span, ft in	39 $4\frac{7}{16}$	36 $1\frac{1}{16}$	47 2	37 $8\frac{3}{4}$	50 11	48 $10\frac{1}{2}$
(m)	(12.0)	(11.0)	(14.37)	(11.50)	(15.52)	(14.90)
Length, ft in	29 $8\frac{11}{16}$	29 $11\frac{1}{16}$	33 $5\frac{1}{2}$	33 $6\frac{3}{8}$	33 $9\frac{1}{2}$	35 $7\frac{3}{4}$
(m)	(9.06)	(9.12)	(10.20)	(10.22)	(10.30)	(10.87)
Height, ft in	10 $0\frac{1}{16}$	11 $6\frac{3}{16}$	12 $7\frac{1}{2}$	12 $3\frac{1}{4}$	12 $1\frac{5}{8}$	12 $5\frac{5}{8}$
(m)	(3.05)	(3.51)	(3.85)	(3.74)	(3.70)	(3.80)
Wing area, sq ft	241.541	229.270	375.659	254.027	405.798	400.416
(sq m)	(22.44)	(21.30)	(34.90)	(23.60)	(37.70)	(37.20)
Empty weight, lb	3,704	4,136	5,309	5,809	5,024	6,636
(kg)	(1,680)	(1,876)	(2,408)	(2,635)	(2,279)	(3,010)
Loaded weight, lb	5,313	6,025	8,047	8,455	8,378	11,464
(kg)	(2,410)	(2,733)	(3,650)	(3,835)	(3,800)	(5,200)
Engine	Sakae 12	Sakae 21	Kinsei 43	Atsuta 32	Sakae 11	Kasei 25
Take-off power, hp	940	1,130	1,000	1,400	1,000	1,850
Max speed, mph/ft	331.5/14,930	351/19,685	240/9,845	360/17,225	235/11,810	299/16,075
(kmh/m)	(533/4,550)	(565/6,000)	(387/3,000)	(580/5,250)	(378/3,600)	(482/4,900)
Cruising speed, mph	207	230	184	265	161	207
(kmh)	(333)	(370)	(296)	(426)	(259)	(333)
Climb rate, ft/min	19,685/7.5	19,685/7.0	9,845/6.5	9,845/4.6	9,845/7.6	16,405/10.4
(m/min)	(6,000/7.5)	(6,000/7.0)	(3,000/6.5)	(3,000/4.6)	(3,000/7.6)	(5,000/10.4)
Service ceiling, ft	32,810	38,520	30,050	35,105	27,100	29,660
(m)	(10,000)	(11,740)	(9,300)	(10,700)	(8,260)	(9,040)
Combat range, miles	1,160	—	915	909	608	1,085
(km)	(1,870)	—	(1,475)	(1,463)	(978)	(1,745)
Fixed guns	7.7 × 2 20 × 2	7.7 × 2 20 × 2	7.7 × 2 —	7.7 × 2 —	— —	7.7 × 1 —
Flexible guns	—	—	7.7 × 1	7.92 × 1	7.7 × 1	7.7 × 2
Bombload, lb	264	264	815	1,234	1,764	1,764
(kg)	(120)	(120)	(370)	(560)	(800)	(800)

Nakajima B5N1, the initial production version of the excellent Japanese carrier-borne torpedo bomber, had been phased out from first-line units by the time the war started. This version, however, continued to be used by training units, notably from the carrier *Hosho*.

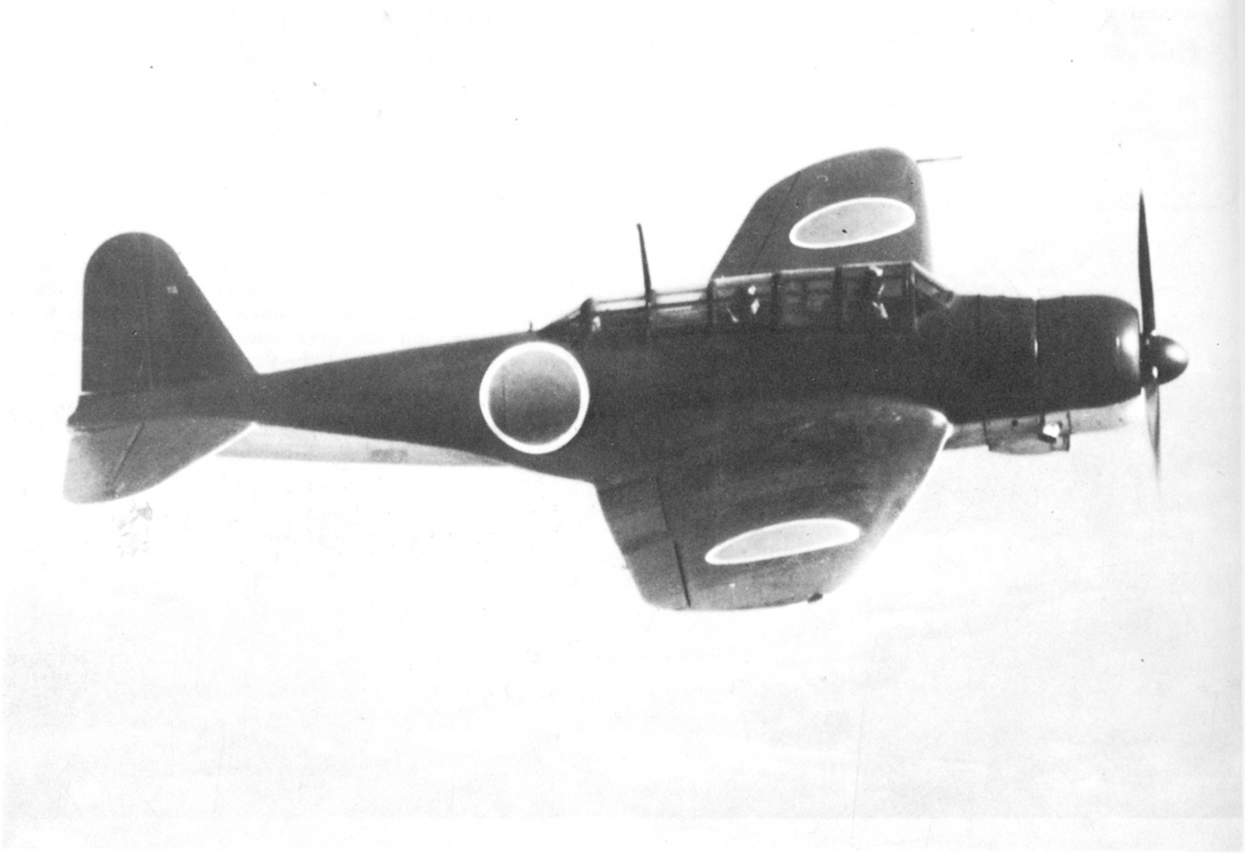


aboard individual carriers, were formed into larger air groups attached to each of the carrier divisions (*Koku Sentai*) to provide for more efficient combat units with increased striking power. By May 1944, the 601st Air Group assigned to the First *Koku Sentai* (*Shokaku, Zuikaku* and *Taiyo*) had a strength of seventy-one A6M5 fighters, ten A6M5 fighter bombers (the Imperial Navy thus preceded the US Navy in replacing carrier bombers with bomb-carrying fighters), eighty-one Suisei dive bombers, nine Suisei reconnaissance aircraft, and fifty-six B6N2 torpedo bombers. At the same time the 652nd Air Group of the Second *Koku Sentai* (*Hiyo, Junyo* and *Ryuho*) had fifty-six A6M5s, twenty-five A6M5 fighter bombers, twenty-seven D3A2s, nine Suisei and eighteen B6N2s, whilst the 653rd Air Group of the Third *Koku Sentai* (*Chitose*, *Chiyoda* and *Zuiho*) comprised eighteen A6M5 fighters, forty-five A6M5 fighter bombers and twenty-seven B6N2 and B5N2 torpedo bombers.

Last Defeats

Where are the Americans going to strike next? By late May 1944, this question had taken a serious dimension for the Japanese High Command. On one hand they knew that forces under Adm. Chester Nimitz had advanced in the Central Pacific along the Gilbert–Marshall Islands line, whilst bypassing points along the northern shore of New Guinea, and that the forces of Gen. Douglas MacArthur had landed on Biak Island on 27 May. Was MacArthur going to invade the Philippines next? Was Nimitz going to move next against the Marianas? Or were they going to launch a united attack at the Palaus, between the previous two lines of advance? Protecting its bets, the Imperial Japanese Navy had moved the fleet to Tawi Tawi, on the north-east coast of Borneo, from where it could deploy against either one of the American lines of advance. But what was the IJN to do with the some 1,650 land-based combat aircraft available in the entire theatre? Lacking the necessary intelligence to concentrate its forces, the Navy was forced to shift units from island to island, incurring heavy operational losses in the process due to the lack of training of many of its aircrews. Nonetheless, in the event that the Marianas would be the next objective of the

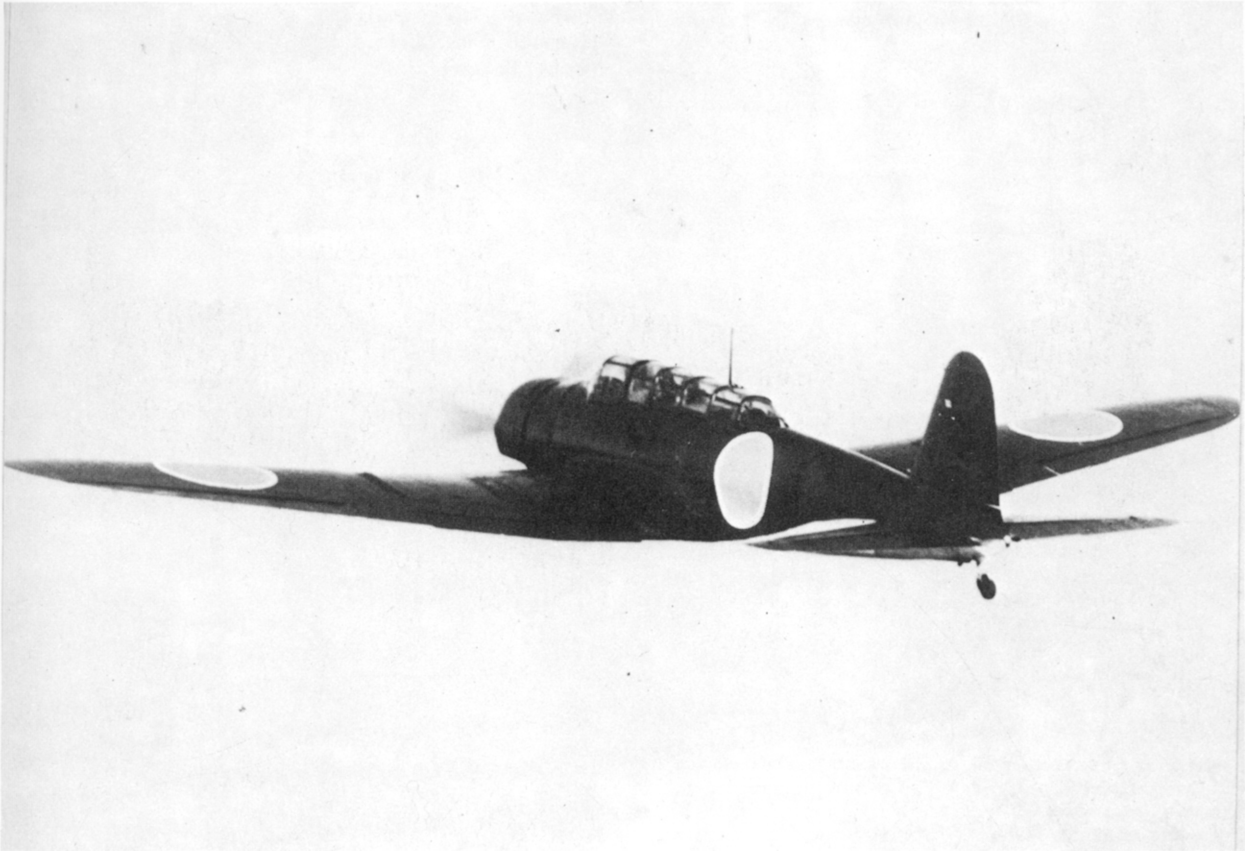
Wartime Allied recognition photograph of a B5N2 painted in spurious Japanese markings. (US Navy)

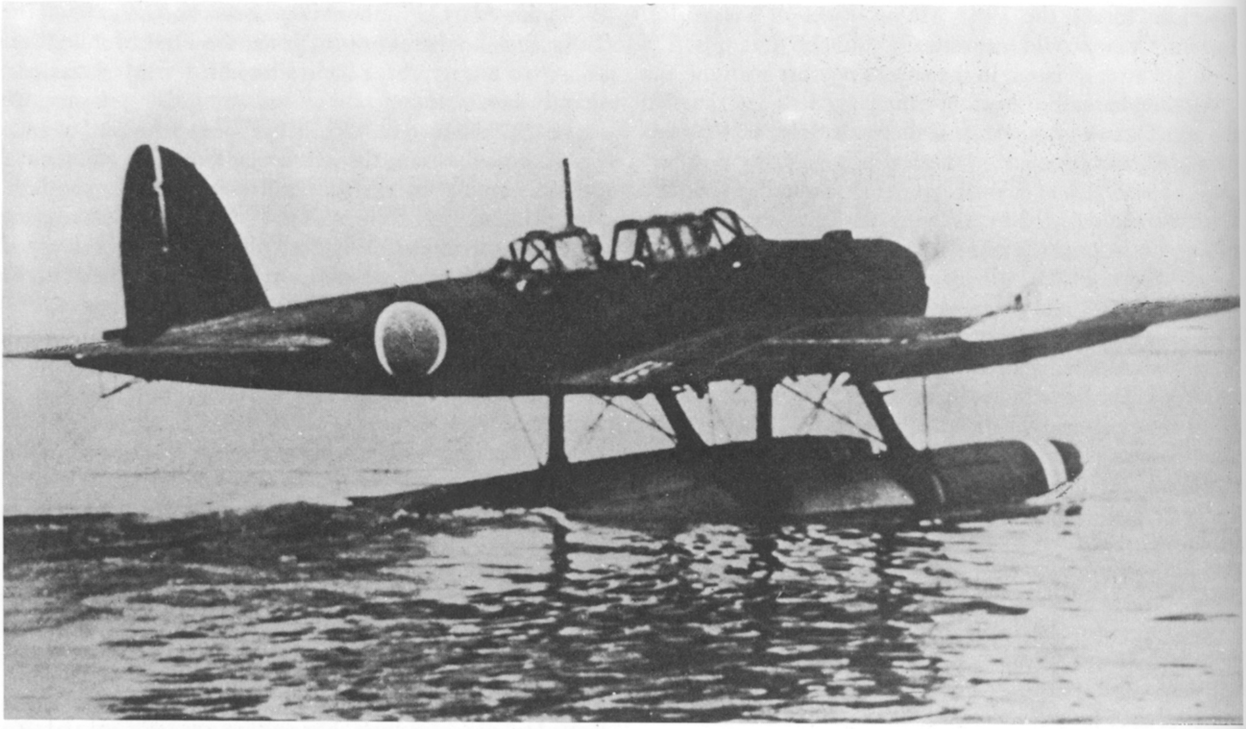


American forces, the First Mobile Fleet of Vice-Adm. Jisaburo Ozawa could theoretically count on the support of some 540 aircraft based in the area. Together with the 452 aircraft embarked aboard his nine carriers (as detailed above), Ozawa was thus able to anticipate that his command would have numerical superiority. Furthermore, Ozawa was in overall command of the First Mobile Fleet, which included not only his nine carriers and their escort of two cruisers and fifteen destroyers but also the Second Fleet of Vice-Adm. Takeo Kurita, which included five battleships, eleven cruisers and fourteen destroyers. Thus, for the first time in the war, the Imperial Japanese Navy had adopted the American Task Force concept in which battleships and cruisers were primarily responsible for providing anti-aircraft firepower for the carriers. Finally, Ozawa benefited from two operational advantages; his carrier-borne aircraft had 50 per cent more combat range than the American aircraft, thus enabling them to strike out of retaliatory range; and his fleet would be sailing from south-west into the wind, thus enabling his carriers to launch and recover aircraft without changing course, whereas the US carriers would have to reverse course to do so. All this careful plan, however, soon fell apart and the carrier battle off the Marianas, the First Battle of the Philippine Sea, ended in yet another Japanese defeat.

Shadowed by US submarines almost as soon as it left the Tawi Tawi anchorage on 13 June, the First Mobile Fleet sailing to engage the Pacific Fleet off the Marianas had already begun losing one of its trumps, as pre-emptive strikes by US carrier aircraft had been launched against Japanese air bases in the Marianas, Iwo Jima and Chichi Jima beginning on 11 June and continuing for six days. Spearheaded by Hellcats, the new and outstanding American carrier-borne fighters, these strikes all but wiped out Japanese land-based aviation in the area and placed the First Mobile Fleet at a decisive numerical disadvantage on the eve of the carrier confrontation. In spite of this blow, the battle between carriers began favourably for Ozawa, as in the afternoon of 18 June he was aware of the position of the American Fleet and, during the night, he was able to position his force out of reach of the American aircraft, but keep the US carriers within striking distance of his longer-ranged aircraft. Before dawn on the 19th, the First Mobile Fleet launched a search with forty-three floatplanes and carrier-based reconnaissance aircraft and soon some of these aircraft reported that the US carriers were some 280 nautical miles from the Third *Koku Sentai* and 380 miles from the other Japanese carriers. For the Japanese the

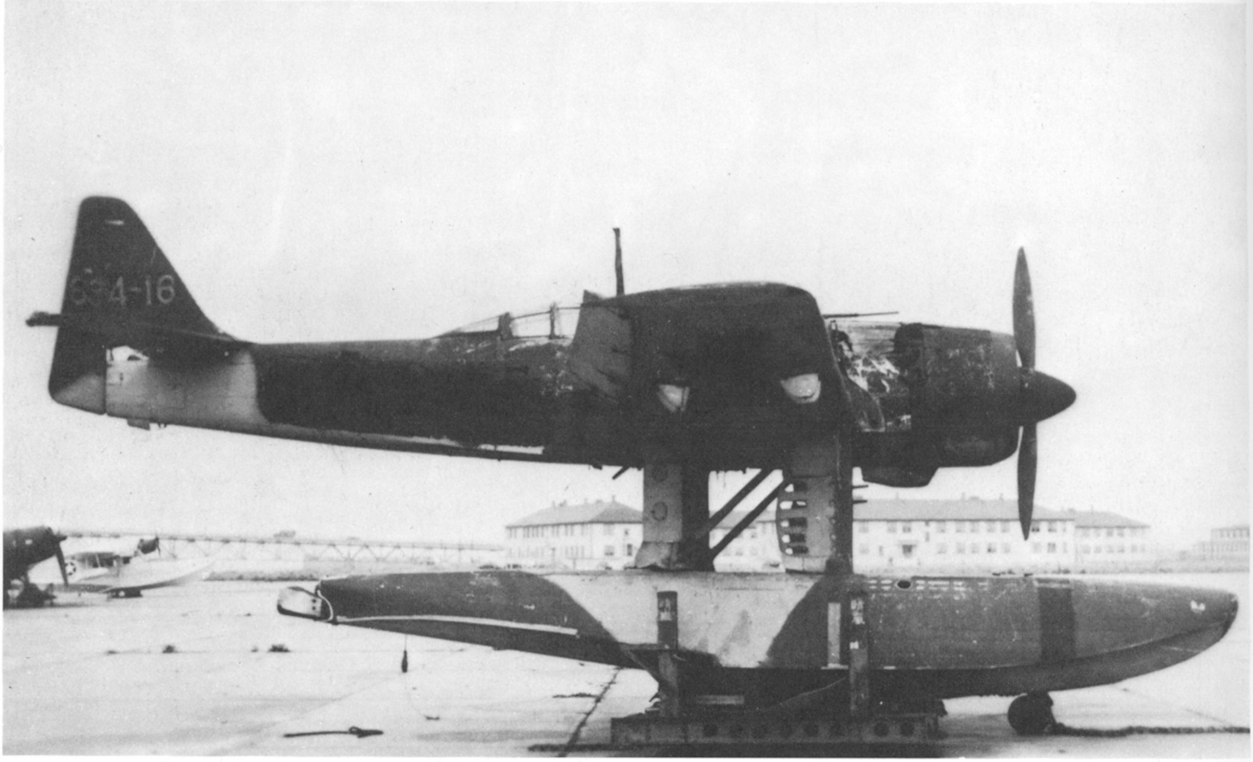
Although quite large for a single-engined aircraft, the B5N2 had graceful lines. For carrier stowage, its 15.518m wings folded upwards. (US Navy)

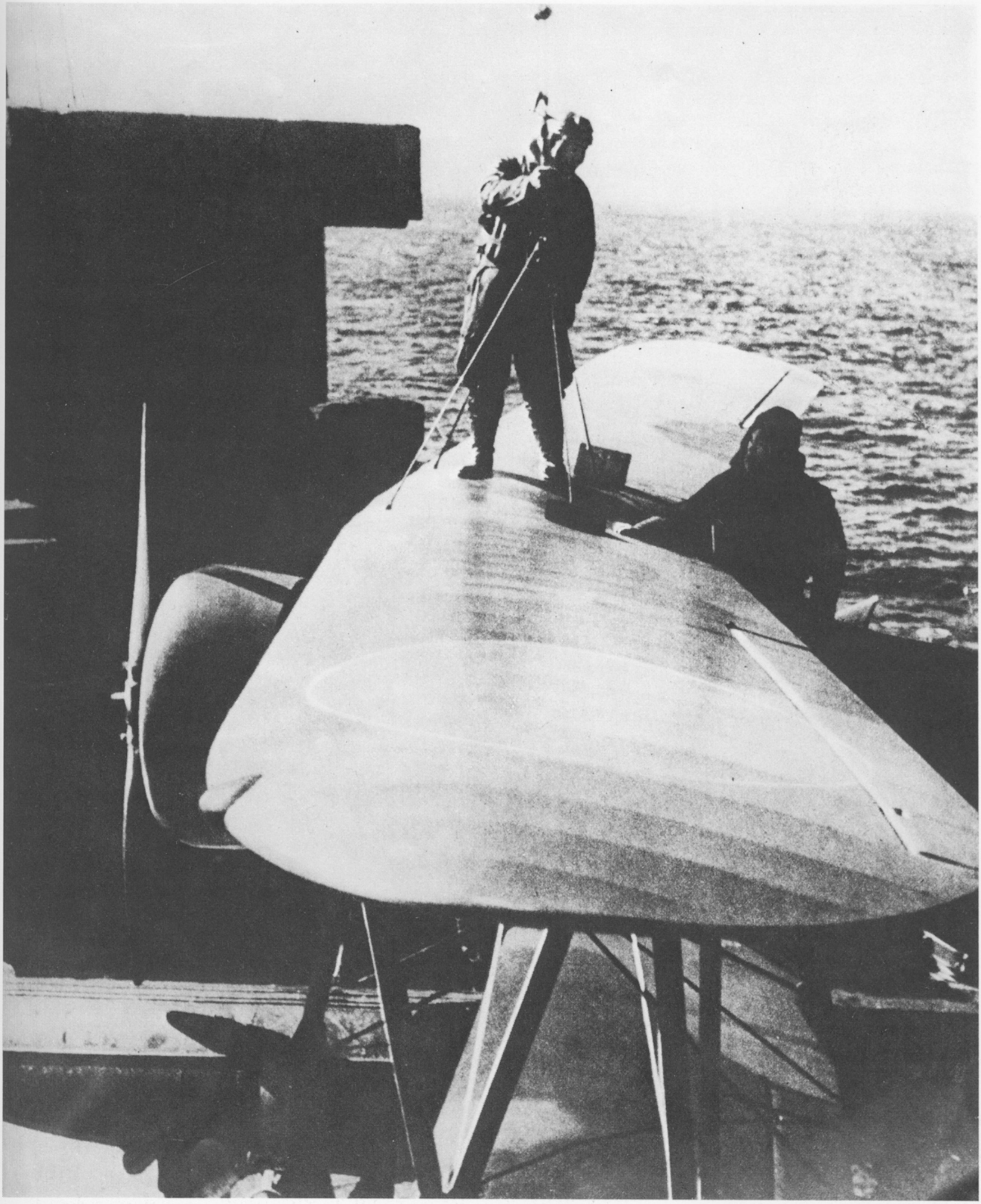




The remarkably long endurance of the cruiser- and battleship-borne Navy Type O Reconnaissance Seaplane Model 11 (Aichi E13A1) made it the ideal aircraft to fly search missions for the carrier air groups. (S. Tanaka)

To operate from the hybrid battleship-carriers *Ise* and *Hyuga*, the IJN organized a special air group which was equipped with Aichi E16A1 floatplanes as illustrated. (Archiv Eckert)





To supplement the aircraft of its carrier air groups, the IJN made extensive use of floatplanes. Here a Nakajima E8N2, a type which continued in first-line service only during the first year of the war, is seen being hoisted aboard a Japanese warship. (US Navy)

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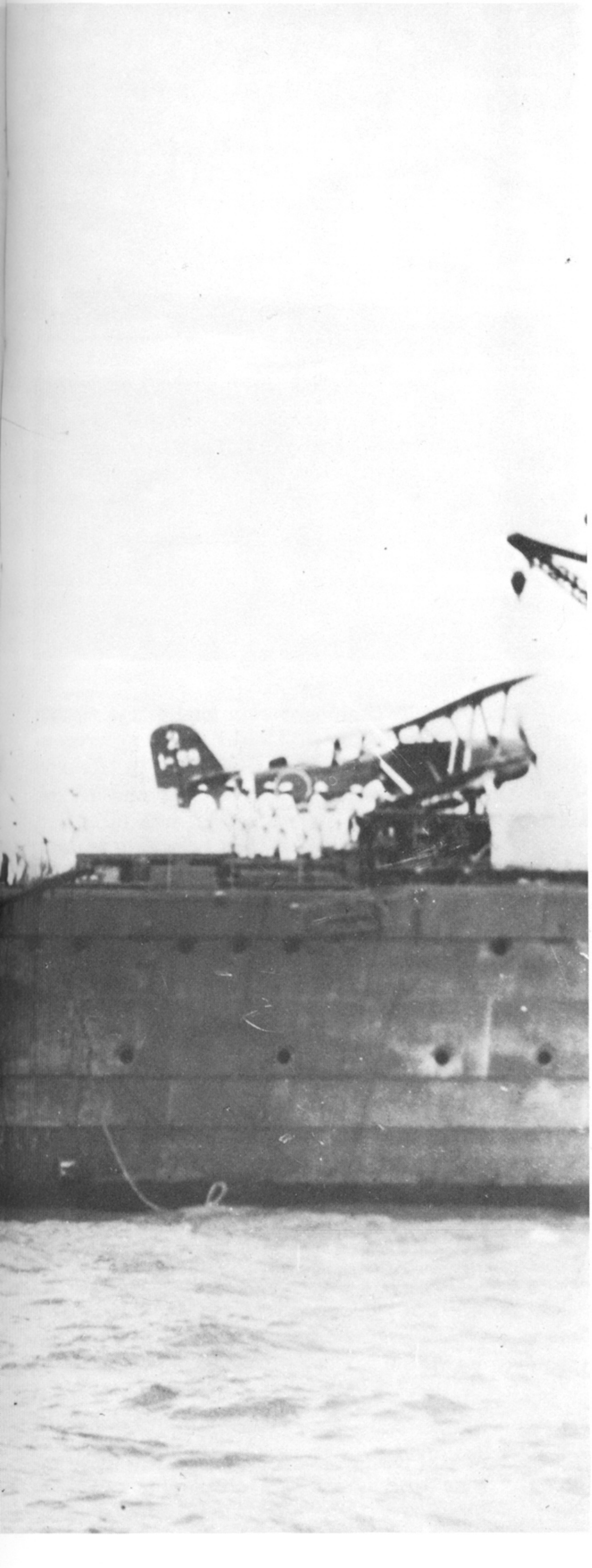


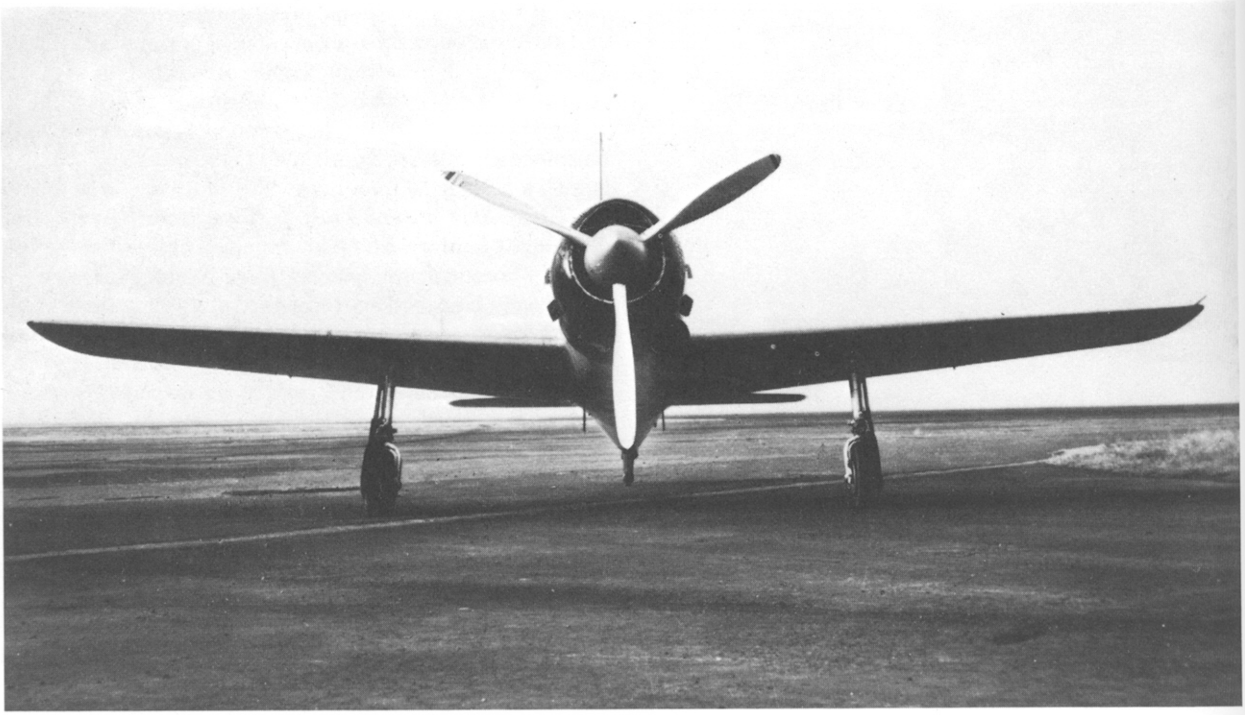
tactical situation presented itself under ideal conditions and the air groups aboard the carriers of the First Mobile Fleet prepared to avenge the defeats suffered by their predecessors since the Battle of Midway.

Upon receiving the sighting report from their reconnaissance aircraft, at 0830hrs the Japanese carriers began to launch a first strike force composed of three waves. From the *Taiho, Shokaku* and *Zuikaku* (First *Koku Sentai*) came forty-eight fighters, fifty-four bombers and twenty-seven torpedo bombers; the Second *Koku Sentai* (*Junyo, Hiyo* and *Ryuho*) launched sixteen fighters, seven bombers and twenty-six torpedo bombers; and the Third *Koku Sentai* (*Chitose, Chiyoda* and *Zuiko*) added fourteen fighters, twenty-eight bombers and twenty-six torpedo bombers, for a total strength of 246 aircraft. (Note that US sources indicate that there were only 178 aircraft in this striking force; it is possible that the difference is due to aircraft which were forced to abort or which were diverted to the Marianas.) Whatever the exact number was, it was undoubtedly the strongest challenge yet thrown against the US carriers. However, the effectiveness of US radar, which enabled interception of this force far out at sea, the superlative performance of the Hellcats and their pilots, and the inexperience of the Japanese crews combined to turn potential success into a resounding defeat.

Shortly after this attack group had been launched towards the US carriers, the First Mobile Fleet suffered its first blow when at 0910hrs the *Taiho*, the latest and heaviest Japanese carrier, was attacked by the submarine USS *Albacore*. In spite of the gallantry of Warrant Officer Sakio Komatsu, one of the carrier's pilots who had just taken off and who crashed his aircraft on one of the two torpedoes launched by the American submarine, *Taiho* was struck by a torpedo. Damage was slight, but a little more than six hours later an electric spark ignited accumulated petrol leaking from a damaged tank; at 1928hrs Vice-Adm. Ozawa's flagship sank. Her aircraft, and those from the eight other Japanese carriers fared little better, as fewer than fifty aircraft made it safely through the Hellcat screen and, faced with intense anti-aircraft fire, could only score a single hit on each of the battleships *Indiana* and *South Dakota*.

Additional strikes were launched by the Japanese air groups with the Second *Koku Sentai* sending twenty fighters, thirty-six bombers and twenty-six torpedo bombers at 1000hrs and the First *Koku Sentai*—in which the *Taiho* and the *Shokaku*, which had been hit by three torpedoes from the USS *Cavalla* at 1220hrs, were already unable to conduct air operations—launching a mere eighteen aircraft from the *Zuikaku* at 1330hrs. None of the aircraft from the Second *Koku Sentai* reached their targets and most were either shot down or destroyed in crash

In addition to the floatplanes of its battleships and cruisers, the Japanese fleet made extensive use of seaplanes carried aboard tenders. Here two Kawanishi E7K2s and two E7K1s are seen on the deck of one of these vessels. (US Navy)

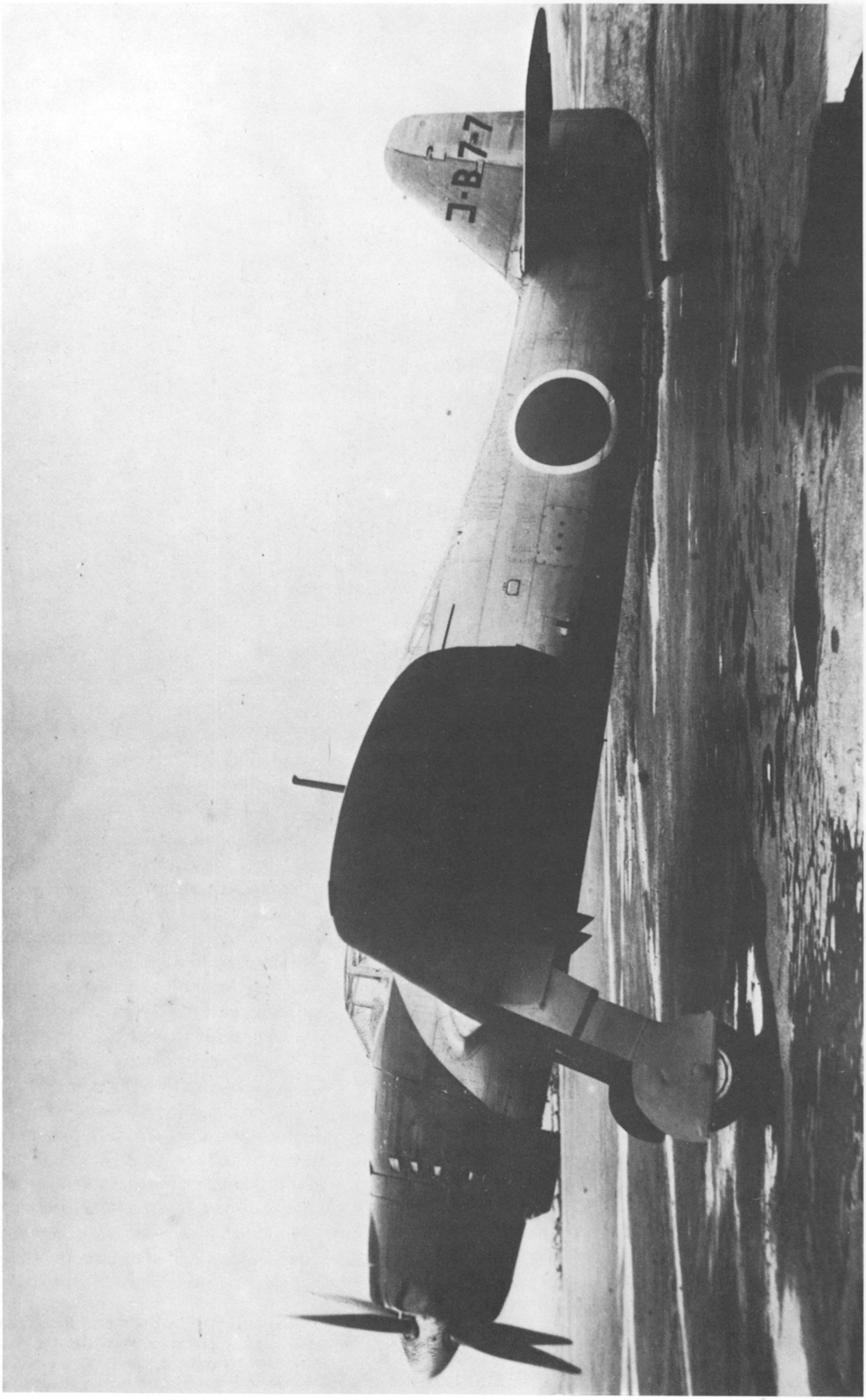


Too late to be operated in combat from carriers, the Navy Carrier Reconnaissance Plane Saiun Model 11 (Nakajima C6N1) had a top speed of 379mph. It would have been very difficult to intercept with Hellcats, the standard US Navy carrier fighters.

landings when they were diverted to Guam. The small force from the First *Koku Sentai* attempted valiantly to reach the US targets, but the American CAP and AA fire prevented them from scoring, and less than a handful of aircraft landed back safely. By then, the First Mobile Fleet had lost all but 280 aircraft and their crews, as well as the *Shokaku*, which sank at 1500hrs, and was about to lose the *Taiho*. For all practical purposes, the Japanese carrier air groups were no more and during the night the *Rengo Kantai* ordered the withdrawal of the First Mobile Fleet. Unfortunately for Vice-Adm. Ozawa's command, which was still out of range of the US carrier planes, the withdrawal to Nagakusuku Bay, Okinawa, was slowed down by the need to refuel at sea in the morning of 20 June. This gave a chance to Task Force 58 to catch up with the retreating Japanese carriers and in a dusk attack the carrier *Hiyo* was sunk, whilst the *Chiyoda, Junyo* and *Zuikaku* were damaged. This attack, however, had been conducted at extreme range and thus the very much crippled First Mobile Force was able to complete its withdrawal without further hindrance.

For the Japanese carrier air groups, the Second Battle of the Philippine Sea—the sixth and last time in the world's history in which enemy carriers confronted each other—was almost a non-battle. True, Vice-Adm. Ozawa's six carriers theoretically could embark a total of 230 aircraft (including twenty-four Aichi E16A1 reconnaissance/bomber floatplanes of the 634th *Kokutai* Naval Air Corps, aboard each of the *Ise* and *Hyuga*, converted battleship-carriers). However, lack of aircraft (most of the assigned air groups had been sent in early October to Formosa to reinforce the local land-based air unit) and, more properly, lack of carrier-qualified crews forced the First Mobile Fleet to sail with only 116 aircraft (fifty-two A6M5s, twenty-eight A6M7s, seven Suiseis, twenty-five Tenzans and four B5N2s, aboard the *Zuikaku, Zuiho, Chitose* and *Chiyoda*) to act primarily as a decoy for the US carriers whilst the seven battleships, sixteen cruisers and twenty-three destroyers of Vice-Adms. Takeo Kurita, Kiyohide Shima and Shoji Nishimura were to strike the American landing fleet in Leyte Gulf. The action was part of the overall Sho No. 1 (Victory 1) plan devised by the Imperial Japanese Navy to oppose the anticipated US landings in the Philippines and which contemplated that the American Fleet would be attacked far out at sea by Navy and Army aircraft based on Formosa and the Philippines, with the battleships and cruisers then concentrating their efforts on annihilating the landing fleet, whilst the First Mobile Force would lure Task Force 38 away from the surface engagement. Unfortunately for

Also too late to be used from carriers, the Aichi B7A1 was intended to replace both the D4Y dive bomber and B6N torpedo bomber and was equivalent to attack aircraft developed at the same time in the US and the UK.



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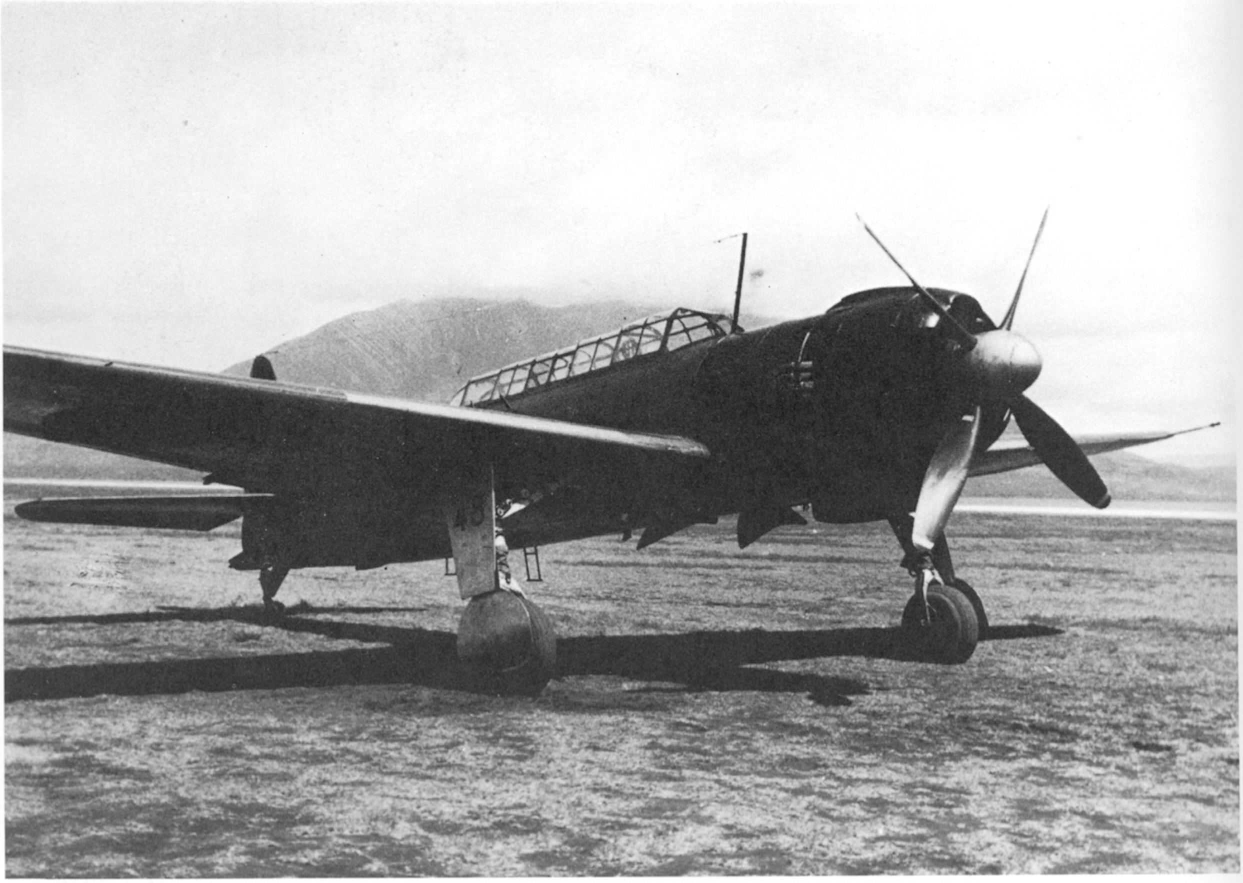
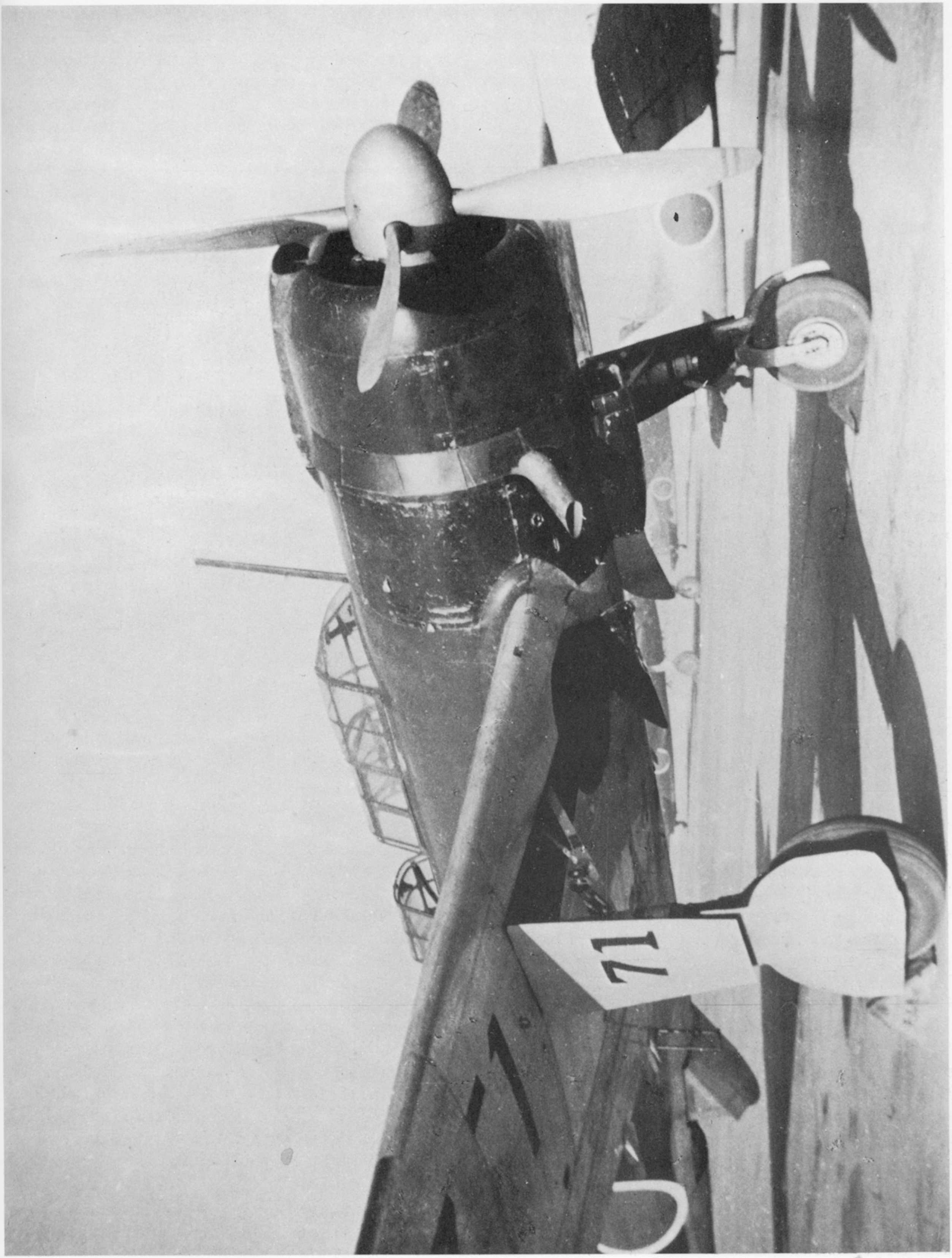


Substitution of the reliable Kasei radial for the original Mamoru engine turned the B6N2 into a satisfactory weapon which equipped Japanese carrier air groups during the last year of the war. (Maru)

the IJN, this well-conceived plan, like that which had been formulated earlier for the defence of the Marianas, fell victim to pre-emptive strikes by US carrier aircraft, which inflicted extremely heavy losses on Formosa-based air units, Japan's primary source of air support.

To oppose the American landing on Leyte, which had taken place on 17 October 1944, the bulk of the Japanese battleships and cruisers left Brunei, on the north coast of Borneo, on 22 October, but their subsequent operations in what became known as the Battle of Leyte Gulf (24–26 October) fall outside the scope of this narrative. Suffice it to say that, in spite of the sacrifice of the First Mobile Fleet, it failed due to the overwhelming American air superiority and to the gallantry of the USN surface vessels and their crews. The odyssey of the First Mobile Fleet and its skeleton carrier air groups, which on the other hand is very much a part of this synopsis of Japanese wartime carrier operations, had begun two days before the departure of the battleships from Brunei, when it had departed Japan. Sailing southwards towards the east coast of Luzon, Vice-Adm. Ozawa's command included the four previously mentioned carriers with 116 aircraft, the hybrid battleships *Ise* and *Hyuga* less aircraft, three light cruisers and eight destroyers. On the 21st and 22nd, while proceeding towards the Philippines, the carrier air groups sent reconnaissance flights, but on both days three aircraft failed to return due to the insufficient training of their crews, who could not, even in the absence of opposition, find their carrier. Recognizing the seriousness of this situation, and fully aware that his carriers were doomed, Ozawa decided that on the day of battle the strike aircraft would be instructed to proceed to Clark Field, if necessary, rather than return to the carriers. Thus, after Task Force 38 was sighted on the morning of 24 October, *Zuiho, Chitose* and *Chiyoda* sent, at 1145hrs, thirty A6M5s, fourteen A6M7s, four Tenzans and five Suiseis on an almost suicidal mission. Intercepted by Hellcats, this meagre force was virtually wiped out and the few survivors limped to Clark Field. The already weak First Mobile Force had lost half of its aircraft. In the afternoon, *Zuikaku* launched an even more pitiful strike of eighteen aircraft

Nakajima B6N1, the intended successor to the B5N2, proved unsatisfactory due to the lack of reliability of its Mamoru radial engine. Note ventral hatch through which a flexible type 97 machine gun could be fired. (Aireview)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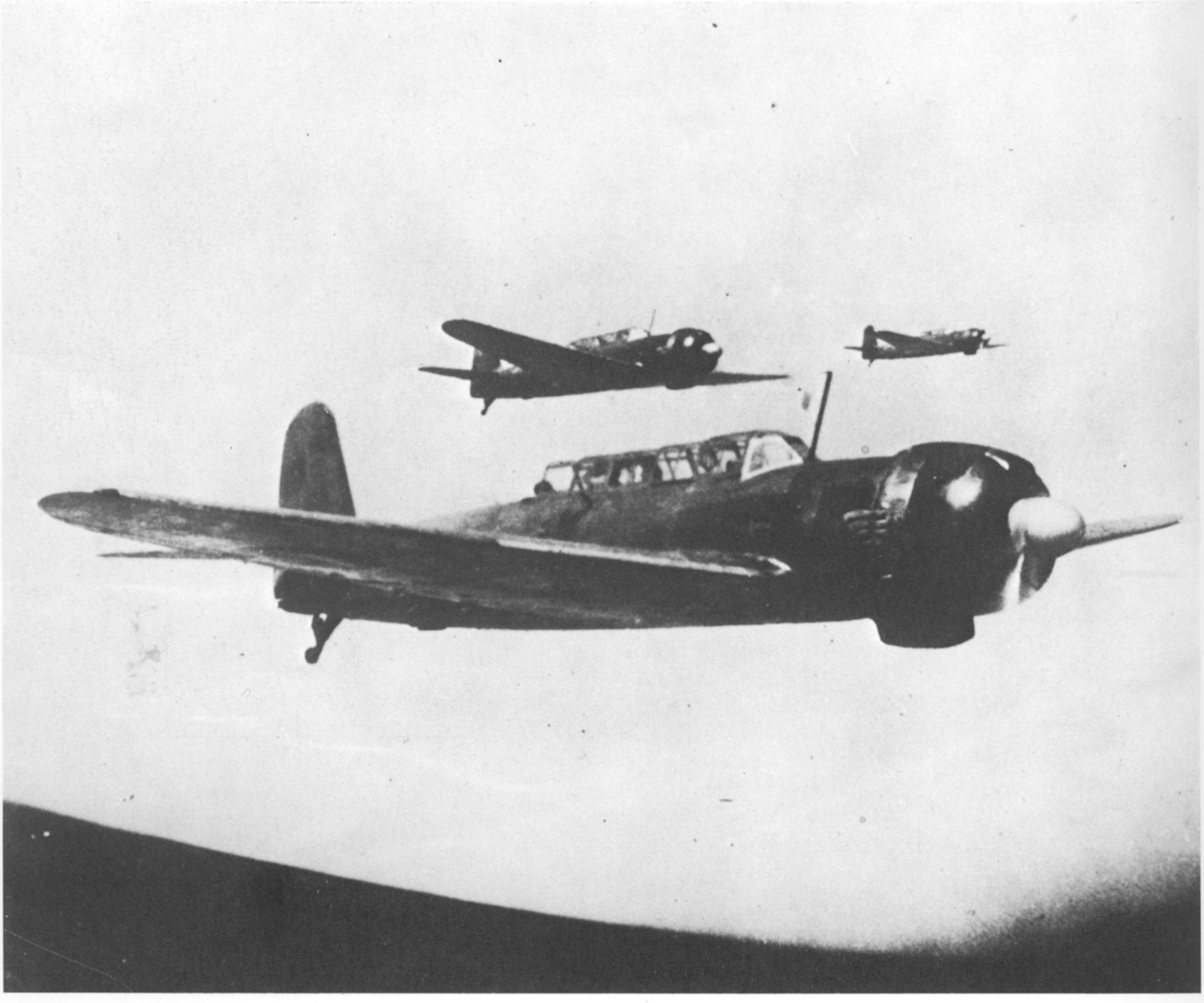
(six A6M5s, eleven A6M7s and one Suisei). A few of these aircraft made it through the CAP and, after attacking the US fleet with unrecorded results, three of them got back to the First Mobile Fleet. The Japanese carrier air groups had fired their last bolt of the war but Ozawa had won a tactical victory as Adm. Halsey took the bait by abandoning the US landing fleet to attack the virtually defenceless Japanese carriers.

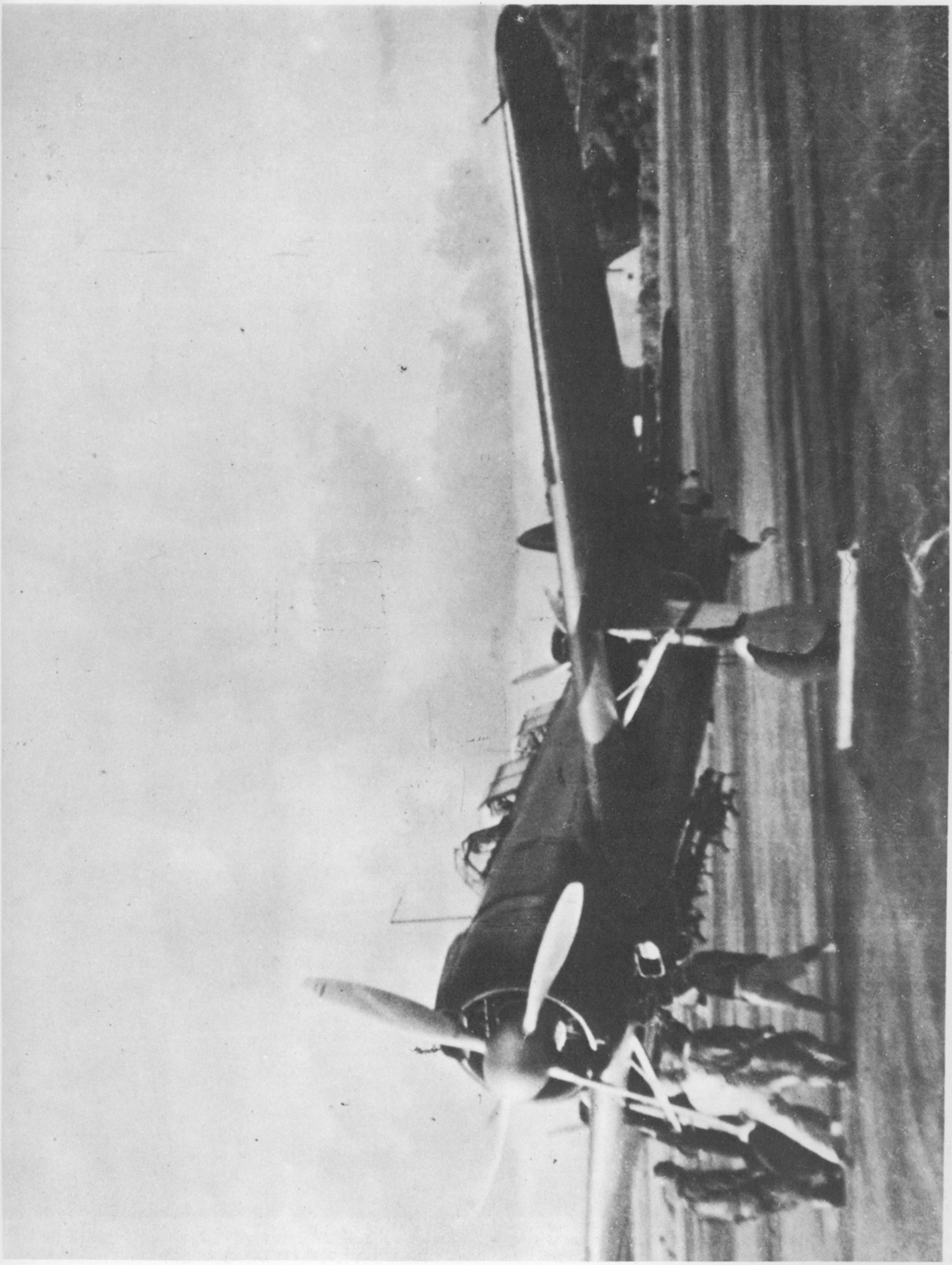
On the morning of 25 October, in anticipation of the full fury of the American air attack, Ozawa decided to transfer most of his remaining aircraft to bases in the Philippines, where it was hoped they would prove more effective when operating in conjunction with land-based units. Thus, when at 0815hrs the first US carrier-borne aircraft arrived within proximity of the First Mobile Fleet, the last thirteen A6M5s took off to fight for the last time from the deck of a carrier. Within seventy-five minutes they were all shot down, and by mid-afternoon the First Mobile Fleet had lost its four carriers, one cruiser and one destroyer. Thirty-two and a half months after Pearl Harbor the Japanese carriers had fought their last battle. It was not that the Imperial Japanese Navy was left without carriers, as it still had or was about to commission the *Hosho*, *Ryuho*, *Junyo*, *Shinyo*, *Kaiyo*, *Unryu*, *Amagi*, *Katsuragi* and *Shinano*, but by then the war had, for Japan, taken a strictly defensive turn. Thus, all aircraft and crews were needed to operate from land bases in the defence of the Philippines, Formosa, Iwo Jima, the Ryukyus and the homeland. The carrier air groups were never to rise again: the sun was setting.



Formation of B6N2 Tenzans. The Japanese wartime censor has painted out the nearest aircraft's tail code making it impossible to determine whether or not these aircraft were assigned to a carrier air group. (Aireview)

Right

Nakajima B6N2 being prepared for a training sortie as evidenced by the empty bomb racks. (USAF)



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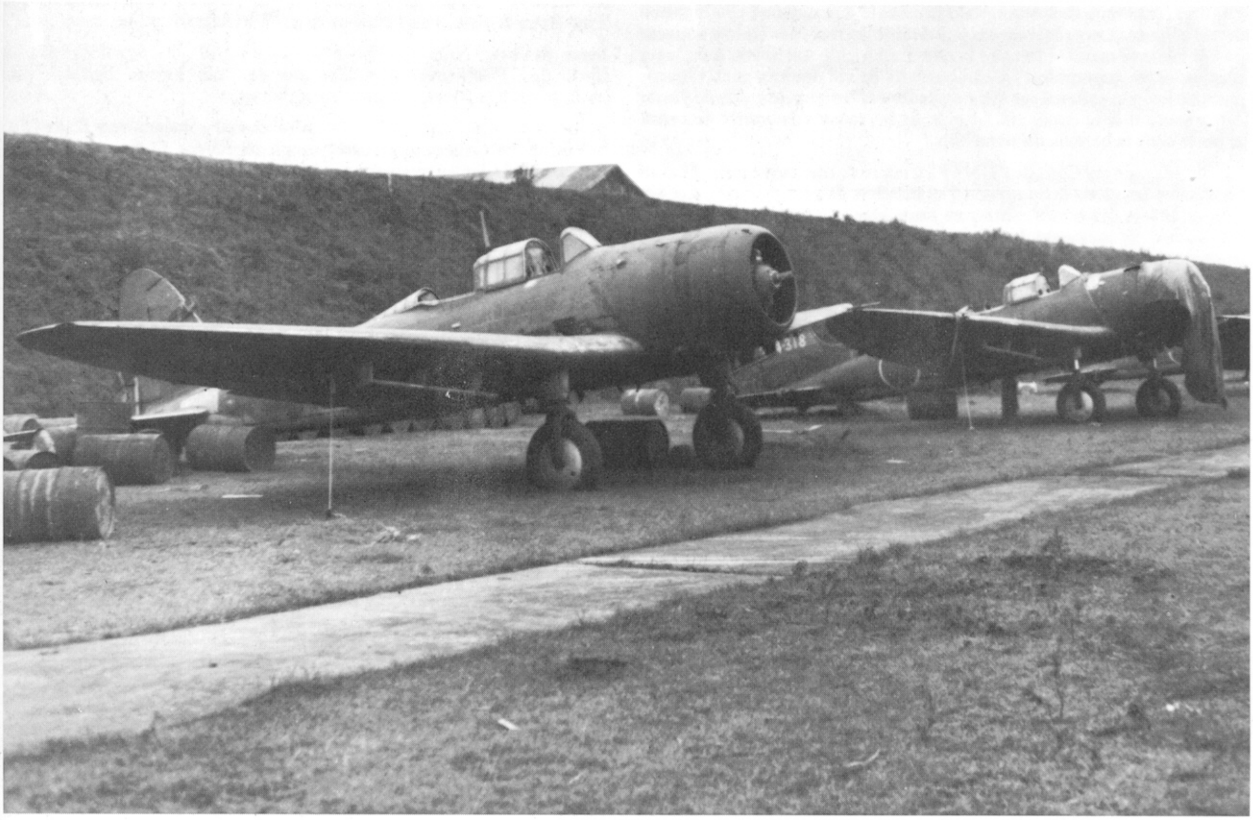
Details of the starboard wing radar antenna on a B6N2 photographed at Atsugi, Japan, on 5 September 1945. (USAF)

The end of the saga: three captured D3A2s, with propellers and other equipment removed, are seen here at Misawa Airfield on 20 October 1945. (USAF)



Notes sur les planches en couleur

Page 25 en haut: Aichi D3A1 Type 11, 'Val', du *Second Koku Sentai* dépeint pendant les opérations dans l'Océan Indien en avril 1942.

Page 25 en bas: Bien que hors d'usage au début de la guerre du Pacifique, le Mitsubishi A5M4 (*Navy Type 96,* chasseur Type 24 embarqué sur porte-avions) équipait toujours les groupes aériens embarqués à bord des porte-avions *Ryujo, Zuiho* et *Hosho*. Cependant, moins de trois mois plus tard, ce type d'avions ne fut plus opérationnel et fut relégué à l'entraînement et à d'autres services auxiliaires.

Page 26 en haut: Pour les attaques contre les objectifs terrestres ou les navires de la marine marchande, le bombardier d'attaque *Navy Type 97* embarqué sur porte-avions pouvait amener 800 kgs de petites bombes, comme le montre ce B5N1 du Yokosuka *Naval Air Corps*, sur six berceaux fixés sous le fuselage.

Page 26 en bas: Mitsubishi A6M2 Type 21, 'Zeke', du *Second Koku Sentai* à l'époque de la bataille des Iles Salomon Orientales en août 1942.

Page 27 en haut: Yokosuka D4Y2 Type 22, 'Judy', du *601st Kokutai* à bord du porte-avions Taiho pour participer à la première bataille de la Mer des Philippines en juin 1944, où ce type d'avion devint opérationnel en tant que bombardier en piqué embarqué sur porte-avions.

Page 27 en bas: Après une série de modifications comprenant le renforcement de l'ossature des ailes, ainsi que le montage de freins plus perfectionnées pour le vol en piqué, le D4Y2 Suisei devint un avion efficace d'attaque embarqué sur porte-avions. (*Maru*)

Pages 28–29:Nakajima B5N2 Type 12, 'Kate', du *First Koku Sentai, First Koku Kantai,* force d'attaque contre Pearl Harbor le 7 décembre 1941.

Page 30 en haut: Nakajima B6N2 Type 12, 'Jill', du *653rd Kokutai* embarqué à bord du porte-avions *Zuikaku* pour la seconde bataille de la Mer des Philippines en octobre 1944.

Page 30 en bas: Les groupes aériens japonais transportés à bord des porte-avions ne faisaient qu'un usage limité du radar, quoiqu'un certain nombre d'avions fussent équipés de matériel air-mer. Cet alignement d'avions photographiés à Atsugi le 6 septembre 1945 est commandé par un B6N2 ayant des antennes fixées sur les ailes et sur le fuselage.

Page 31 en haut: Marques distinctives des porte-avions de l'IJN: (A) *Akagi* (B) *Kaga* (C) *Soryu* (D) *Hiryu* (E) *Ryujo* (F) *Shoho* (G) *Taiyo* (H) *Shokaku* (I) *Zuikaku*. Rouge, 1ère division de porte-avions; bleu, 2ème division; néant, 3ème division; jaune, 4ème division et blanc, 5ème division. Les marques peintes sur la dérive de chaque avion comportaient une lettre initiale pour identifier la division de porte-avions à laquelle appartenait l'avion et un chiffre romain pour indiquer sa position au sein de la division (I: Ier, II: 2ème, etc. . . .).

Page 31 en bas: Véhicule ravitailleur, modification éventuelle d'un camion 2 tonnes marque Isuza TX40 utilisé par les unités aériennes de l'IJN basées à terre.

Page 32: (1) Pilote de l'Aéronavale Impériale Japonaise en combinaison de vol d'hiver. Les rabats du casque doublé de fourrure étaient souvent portés de cette manière lorsque le pilote sortait de son avion, à en juger d'après les photographies. La combinaison de vol doublée et très lourde porte un insigne national sur l'épaule droite et l'insigne du grade de *Junior Lieutenant* sur le bras gauche. Le gilet de sauvetage rembourré de kapok se porte sous le harnais du parachute.

(2) *Petty Officer 3rd Class* de l'IJNAF en tenue de corvée normale d'été en lin blanc et casquette de son grade. Les matelots de pont portaient soit des salopettes soit des combinaisons en tissu blanc; lorsqu'ils s'occupaient des avions, ils mettaient la version blanche de la casquette ordinaire japonaise, revêtue de l'insigne représentant une ancre bleue. L'insigne cousu sur le bras indique l'unité et le grade—l'emblème distinctif d'un avion entouré d'une guirlande.

(3) Pilote de chasse vêtu de la combinaison légère d'été; notez le détail de la poche et du bouton. Le casque est également du type léger porté en été, en tissu marron non doublé. L'insigne de grade du *Petty Officer 1st Class* se porte ici sur le côté gauche de la poitrine; les photographies en montrent le port soit sur le bras soit sur la poitrine.

Farbtafeln

Seite 25 oben: Aichi D3A1 Modell 11, 'Val', des *Second Koku Sentai*, während der Operationen im indischen Meer, April 1942, dargestellt.

Seite 25 unten: Obgleich am Anfang des Krieges im Stillen Ozean schon veraltet, bildete trotzdem der Mitsubishi A5M4 (*Navy Type 96* Trägerjagdflugzeug Modell 24) die Ausrüstung der Geschwader an Bord den Flugzeugtragern *Ryujo*, *Zuiho* und *Hosho*. Jedoch, innerhalb dreier Monate wurde wurde der Typ Schulung und Hilfsdiensten übergeben.

Seite 26 oben: Im Gebrauch gegen Landziele und Handelsschiffe konnte der Trägerangriffbomber *Navy Type 97* mit 800kg kleiner Bomben bewaffnet werden. Diese konnten, wiehier beim B5N1 des Yokosuka *Naval Air Corps* geschildert, in sechs Behältern an der Unterseite des Rumpfes getragen werden.

Seite 26 unten: Mitsubishi A6M2 Modell 21, 'Zeke', des *Second Koku Sentai* zur Zeit der Schlacht um die Ostsalomoninsel, August 1942.

Seite 27 oben: Yokosuka D4Y2 Modell 22, 'Judy', des *601st Kokutai* an Bord des Flugzeugträgers *Taiho* für die erste Schlacht im philippinschen Meer in Juni 1944 bereit, wo der Typ als Operationsdecklandesturzkampfflugzeug debütierte.

Seite 27 unten: Nach einem Verstärkungs programm, worunter Bearbeitung des Tragflügelaufbaus und Anbau aufgebesserter Sturzbremsen eingenommen wurde, ist das D4Y2 Suisei zum wirkungsvollen Decklandeangriffsflugzeug geworden. (*Maru*)

Seiten 28–29: Nakajima B5N2 Modell 12, 'Kate', des *First Koku Sentai*, *First Koku Kantai*, Pearl Harbor Angriffsstrietkraft, 7 Dezember 1941.

Seite 30 oben: Nakajima B6N2 Modell 12, 'Jill', des *653rd Kokutai* an Bord des Flugzeugträgers *Zuikaku* für die zweite Schlacht im philippinischen Meer, Oktober 1944, bereit.

Seite 30 unten: Japanische Trägergeschwader haben von Radar nur beschränkten Gebrauch gemacht, obgleich etliche Flugzeug mit Luft-auf-Schiff Radar ausgerüstet waren. Diese in Afsuge am 6 September 1945 geschilderte Flugzeugreihenfolge hat an ihrer Spitze ein B6N2 mit Tragflügel und Rumpfantenne.

Seite 31 oben: Flugzeugträgerkennzeichen der kaiserlichen japanischen Marine: (A) *Akagi* (B) *Kaga* (C) *Soryu* (D) *Hiryu* (E) *Ryujo* (F) *Shoho* (G) *Taiyo* (H) *Shokaku* (I) *Zuikaku*. Rot, Ite Trägerdivision; blau, 2te Trägerdivision; keine Farbe, 3te Trägerdivision; gelb, 4te Trägerdivision und weiss, 5te Trägerdivision. Flugzeugkielflossabzeichen bestand aus einer Anfangsbuchstabe, die die Trägerdivision auswies, und eine lateinische Ziffer, wodurch die Position des Trägers in der Divisionsgefechtsformation gezeigt wurde (z.b. I: Ite, II: 2te, u.s.w.)

Seite 31 unten: Nachfüllungstankwagen, vermutlich eine Umarbeitung eines 2-tonnen Isuza TX40 Lkw im Gebrauch der Lufteinheiten der kaiserlichen japanischen Marine die aus festen Flugplätzen operierten.

Seite 32 (1) Pilot der kaiserlichen japanischen Marinenluftwaffe im Winterfliegeranzug. Die Klappen des mit Pelz gefütterten Winterhelmes wurden ausserhalb des Flugzeuges oft so getragen. Beim schweren, gefütterten Anzug wird am linken Schulter der Nationaltuchstreifen und am rechten Arm der Rangstuchstreifen eines *Junior Lieutenant* getragen. Die mit Planzenfaser gefüllte Rettungsweste wird unter dem Fallschirmgurtwerk getragen.

(2) *Petty Officer 3rd Class* der IJNAF in normalem aus weissem Leinen hergestellten Sommerarbeitsanzug und mit der Mütze dieses Ranges. Verschiedene Überkleider und Anzüge aus weissem Stoff wurden von den Deckmannschaften getragen. In Umgang mit den Flugzeugen wurde die normale japanische Feldmütze in weiss mit blauem Ankerabzeichen getragen. Der Gattungstuchstreifen—ein Flugzeugzeichen mitten im einem Kranz—deutet auf Gattung und Dienstgrad.

(3) Jagdpilot in leichtem Sommerfliegeranzug; beachtenswert ist die Einzelausführung der Taschen und Knöpfe. Der Helm is auch vom ungefütterten, braunen Sommertyp. Der Dienstgradtuchstreifen eines *Petty Officer 1st Class* wird hier an der linken Brust getragen; in Photos sieht man, dass solche Tuchstreifen entweder am Arm oder an der Brust getragen wurden.

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